Technical Program

*IS&T/SPIE 21st Annual Symposium*

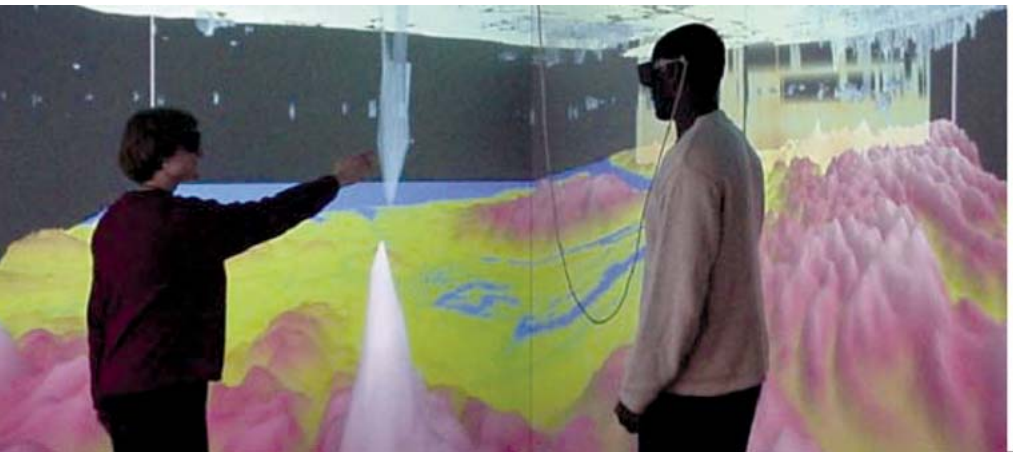
# Electronic Imaging

## Science and Technology

**18–22 January 2009**

San Jose Marriott and San Jose Convention Center

San Jose, California, USA



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*IS&T/SPIE 21st Annual Symposium*

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NETWORK WITH PEERS — HEAR THE LATEST RESEARCH

# Welcome

On behalf of IS&T and SPIE, we welcome you to the 21st annual Symposium on Electronic Imaging.

Imaging is pervasive in the human experience, be it the photographs that we take in our everyday lives, or those that are used in space exploration, medical imaging, entertainment, science, or national security.

EI 2009 is the one international conference where papers on all aspects of electronic imaging are presented, and where you can develop both your career and business by networking with leading researchers and entrepreneurs in the field.

We look forward to seeing you this week and sharing with you the joy of the entire spectrum of electronic imaging.

*Symposium Chair:*

**Nitin Sampat,** Rochester Institute of Technology

*Symposium CoChair:*

**Jan P. Allebach,** Purdue Univ.

*Left cover photo courtesy of Raytheon.*

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### Multimedia Processing and Applications



### Visual Communications and Image Processing

# Electronic Imaging

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**Jan P. Allebach,** Symposium CoChair, Purdue University
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**Thrasyvoulos N. Pappas,** Northwestern Univ.
**Jinah Park,** Information and Communications Univ. (South Korea)
**Ilya Pollak,** Purdue Univ.
**Majid Rabbani,** Eastman Kodak Co.
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**Alessandro Rizzi,** Univ. degli Studi di Milano (Italy)
**Brian G. Rodricks,** Fairchild Imaging
**Bernice E. Rogowitz,** IBM Thomas J. Watson Research Ctr.
**Juha Röning,** Univ. of Oulu (Finland)
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**Frederic Truchetet,** Univ. de Bourgogne (France)
**Vladimir Uskov,** Bradley Univ.
**Ping Wah Wong,** IDzap LLC
**Andrew J. Woods,** Curtin Univ. of Technology (Australia)

Tuesday 20 January . . . . . 8:00 to 8:50 am

*Marriott Ballroom*

## Neptune's Garden: Exploring the Secrets of the Deep Undersea

**David Gallo,** Woods Hole Oceanographic Institute

*Abstract:* We've only explored a few percent of the world beneath the waves and yet we have found the most incredible things. The world's highest mountains, deepest valleys, underwater rivers, waterfalls, lakes, and thriving communities of life, all exist in a world without sun. Almost every expedition returns to shore with new information about our origins, evolution and destiny. This presentation will use high resolution video to share some of the most recent discoveries and will introduce the audience to a new era of undersea exploration.

The development of new platforms (submarines, robots) and new sensors (cameras, sonars) allows us to explore even the deepest, darkest, and most hostile parts of the ocean with unprecedented clarity and accuracy. Perhaps more importantly is the ability to immerse scientists and lay public alike in the mysteries and myth of the undersea world.

*Biography:* **David Gallo** is Director of Special Projects at the Woods Hole Oceanographic Institution.

He received a B.Sc and M. Sc. degree in geological science from the State University of New York at Albany and a Ph.D. in oceanography from the University of Rhode Island. In 1987 he was invited by Dr. Robert Ballard (discoverer of the wreck of RMS Titanic) to join his team at the Woods Hole Oceanographic Institution as the Assistant Director of the Center for Marine Exploration.

In his present role, David works closely with scientists and engineers at the forefront of global exploration and discovery. He has participated in numerous expeditions to the Atlantic, Pacific and Indian Oceans, and to the Mediterranean Sea. He was one of the first oceanographers to use a combination of submarines and robots to map the undersea world. He was a participant during an exploration of RMS Titanic and the German battleship Bismarck using the Russian MIR submarines and a participant in a recent expedition to find the lost WWII submarine USS Grunion.

In addition to ocean exploration, he is currently interested in understanding the relationship between humanity and the sea. He was closely involved in the formulation and development of the Liquid Jungle Laboratory of Panama, a venture designed to better understand the interaction between people, tropical forests, and coastal marine habitats.

David is passionate about exploration and discovery and dedicated to communicating the importance of science and engineering to the public-at-large. He maintains close working relationships with scientists, filmmakers, and media broadcasters (Discovery Channel, History Channel, and National Geographic, PBS). He was instrumental in the development of the JASON PROJECT and is presently involved with the FIRST Robotics Competition, and with the National Underwater Robotics Competition.

David has lectured extensively both nationally and internationally, to audiences ranging from elementary school children through CEO's and he has participated in numerous television and radio broadcasts.

**William Lange,** Woods Hole Oceanographic Institution

**William Lange** has been involved in developing and applying new technologies and techniques to observe and view the underwater world for 20 years. He was among the first to use high resolution and high-definition imaging systems for oceanographic research. His efforts have resulted in the production of camera systems with unprecedented clarity and resolution.

These imaging systems, designed to work from very shallow coastal zones to depths exceeding 20,000 feet, have been used to survey and explore numerous shipwrecks, including the wreck of the RMS Titanic. They have also produced startling images of new life forms, including those found at the deep-sea hydrothermal vents. Working in collaboration with Sony, Bill's work has revolutionized the way that we view the oceans including the mid-water regions and the deep-sea floor, which make up two of the largest environments on Earth.

The imaging systems developed at the Advanced Imaging and Visualization Laboratory has included multi-spectral imaging systems, lowlight intensified, photo-grammetric stereo, 3D still and motion HD/UHDTV systems. A key approach has been the development of high-level integrated design architectures for the optical, sensor, metadata, control, and data acquisition sub-systems. This modular design architecture allows rapid prototyping of new imaging systems for scientific imaging as well as traditional filmmaking applications. The scientific, entertainment, and defense communities have employed these imaging systems for many years, but recently these tools have been applied to the marine archeology field where they are already having a dramatic impact on how marine archeological imagery and data is acquired and interpreted.

Beyond scientific imaging, Bill's goal is to share the excitement of science by providing high quality imagery for museums and documentaries. He was a key participant in the formulation of The Jason Project, the development of an eight thousand square foot traveling museum exhibit "Extreme Deep Mission to the Abyss" and has been involved in numerous scientific and television projects as well as many Imax films. He is currently developing technologies, storylines and programming for 2D/3D HDTV/UHDTV, Full Dome and Immersive venues for presentation in science centers, museums and aquariums venues.

He is also concerned with scientifically documenting and monitoring marine mammals, and is involved in whale observation, husbandry, transportation and rehabilitation projects around the world. This program has been augmented by the design of a variety of aerial HD and hyper HD imagers for manned and unmanned aerial imaging platforms.

Under the tenet that observation is the cornerstone of science, Bill continues to gather unique images that advance our knowledge of the planet and tell the many fascinating stories of science.

# Awards and Plenary Presentations

Wednesday 21 January . . . . . 8:15 to 8:30 am
*Marriott Ballroom*

## Award Presentations

Wednesday 21 January . . . . . 8:30 to 9:15 am
*Marriott Ballroom*

## Audio and Video: Making It and Selling It in the 21st Century

**Andrew Setos,** Fox Entertainment Group

*Abstract:* From the beginning, produces of audio-visual works have striven to seek out the widest possible audiences. This stands to reason, as the widest possible audience increases the probability of success for a particular effort. Of course this presumes an orderly distribution, rather than unauthorized redistribution. In recent times the capabilities of consumer accessible technology have made possible a lot of unauthorized redistribution of audio-visual works and the perception by the public is that producers would rather bottle up their works rather than purvey them. This has never been farther from the truth. Past, recent and very recent offerings will be reviewed that discuss the ever increasing and innovative ways audio-visual works are being made available and the technologies that realize those ways.

*Biography:* **Andrew G. Setos** was named President of Engineering for the Fox Group, a unit of the News Corporation in February 2002. In this role, Mr. Setos serves as senior technology strategist for the company with oversight of engineering for Fox divisions, including all film and television units.

Prior to this appointment, Mr. Setos was Senior Vice President, Broadcast Operations & Engineering for Fox Television and Executive Vice President of the News Technology Group. He continues to have oversight of the Fox Technology Group and Fox Networks Engineering & Operations.

Mr. Setos joined the Fox organization in 1988 and during his tenure has designed and built several state-of-the-art facilities, including the $120 million Fox Network Center – Los Angeles, the first all digital broadcast network operations hub, the headquarters of the Fox News Channel in New York, the first all digital television facility for national news and the recently completed $100 million Fox Network Center – Houston, an all High Definition facility that services Fox's Regional Sports Channels and as backup for its sister facility in Los Angeles. He was a contributor to the DCI specification for Digital Cinema now rolling out throughout the world. In the digital sector, he has also been responsible for important contributions in the area of content protection and use including co-authoring the Broadcast Flag, the development of BD+ for the new High Definition disc format Blu-ray and Digital Copy. Additionally, Mr. Setos has managed Fox's production facilities as well as worldwide real estate operations and continues to manage the satellite and fiber transmission portfolios of the company.

Prior to joining Fox, Mr. Setos was Senior Vice President, Engineering and Operations at Viacom Networks Group, from 1986 to 1988, and Vice President Engineering and Operations at Warner Amex Satellite Entertainment Company from 1980 to 1986. At these companies, Mr. Setos was responsible for development and execution of production and distribution technology for: MTV, MTV Europe, The Movie Channel, Nickelodeon, and Viewers Choice.

Before entering the cable industry, he was Chief Engineer at WNET/Thirteen New York where he was responsible for planning and supervising the production technologies for such award-winning series as "Live from Lincoln Center," "Dance in America," and "The McNeil/Lehrer News Hour."

A fellow of the Society of Motion Picture and Television Engineers (SMPTE), Mr. Setos has been a member of the Advanced Television Systems Committee's executive board and served on the FCC's Technology Advisory Committee. He is also a past Chairman of the University of Southern California's Entertainment Technology Council. He holds patents and a Bachelor of Science degree from Columbia University School of Engineering and Applied Science.

## Awards and Plenary Presentations

*Marriott Ballroom*

Plenary Presentation:

### Neptune's Garden: Exploring the Secrets of the Deep Undersea

Tuesday 20 January . . . . . 8:00 to 8:45 am

**David G. Gallo,** Woods Hole Oceanographic Institute; **William Lange,** Woods Hole Oceanographic Institution

### Award Presentations

Wednesday 21 January . . . . . 8:15 to 8:30 am

Plenary Presentation:

### Audio and Video: Making it and Selling it in the 21st Century

Wednesday 21 January . . . . . 8:15 to 9:15 am

**Andrew Setos,** Fox Entertainment Group

## Technical Event: Mobile Imaging II

*Convention Center, B2*

Monday 19 January . . . . . 6:30 to 8:30 pm

*Chair:* **Gabriel Marcu,** Apple Computer, Inc.

## All-Conference Reception

*Marriott Ballroom*

Wednesday 21 January . . . . . 7:30 to 9:30 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.

## Interactive Paper Session

*San Jose Convention Center, Exhibit Hall 1*

Tuesday 20 January . . . . . 6:00 to 8:30 pm

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

Author Set Up. . . . . Monday from 8:00 to 10:00 am

General Viewing . . . . . Monday/Tuesday 10:00 am to 4:00 pm

### Interactive Paper Session

Tuesday . . . . . 6:30 to 8:00 pm

The Interactive Paper Session will once again take place in conjunction with the Symposium Demonstration Session (see below).

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 in the Exhibit Hall 1.

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.

# Special Events

## Symposium Demonstration Session

*San Jose Convention Center, Exhibit Hall 1*

Tuesday 20 January . . . . . 6:00 to 8:30 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. Information regarding participation is found below.

## Exhibition

Tuesday 20 January . . . . . 10:00 am to 8:30 pm

Wednesday 21 January . . . . . 10:00 am to 4:00 pm

An intimate exhibit features select Electronic Imaging companies and publishers showcasing the latest products, technologies, and books.

There is no charge to visit the exhibit; however a registration badge is required for admittance. On-site registration is available for exhibit-only visitors.

*Confirmed Exhibitors at the time of press:*

3D Consortium

The MathWorks

Vision Systems Design

Image Engineering

Photonics Media/Laurin Publishing

### 3D Sports Image Exhibit

Held in hallway outside A7-8 during the Stereoscopic Displays and Applications Conference, Monday through Wednesday, witness an exciting collection of 3D sports photography direct from the new book “In Your Face 3-D” by celebrated Sports Illustrated photographer David Klutho. The book will also be for sale at the EI registration desk.

### Phantograms 2009 Exhibit

Phantograms are a special type of stereo image that never fail to fascinate the viewer and elicit a surprise. Through perspective distortion, a stereo pair is manipulated into an anaglyph image that when placed flat on a table and viewed with common red/cyan glasses, appears to be a real object or scene. Creating the images at life-size and in true color enhances this illusion. And because the subject is placed near to the stereo window, the eyes don’t have to work as hard to lock into focus. For this reason, many people who normally have difficulty viewing stereo images have no trouble with phantograms.

Terry Wilson will once again display a variety of these decidedly simple, low-tech phantograms in the exhibit area, during exhibit hours. Sizes range from postcards to 30” x 60” prints, representing a number of stereo photographers, including Terry herself. Most of the images will be for sale as well.

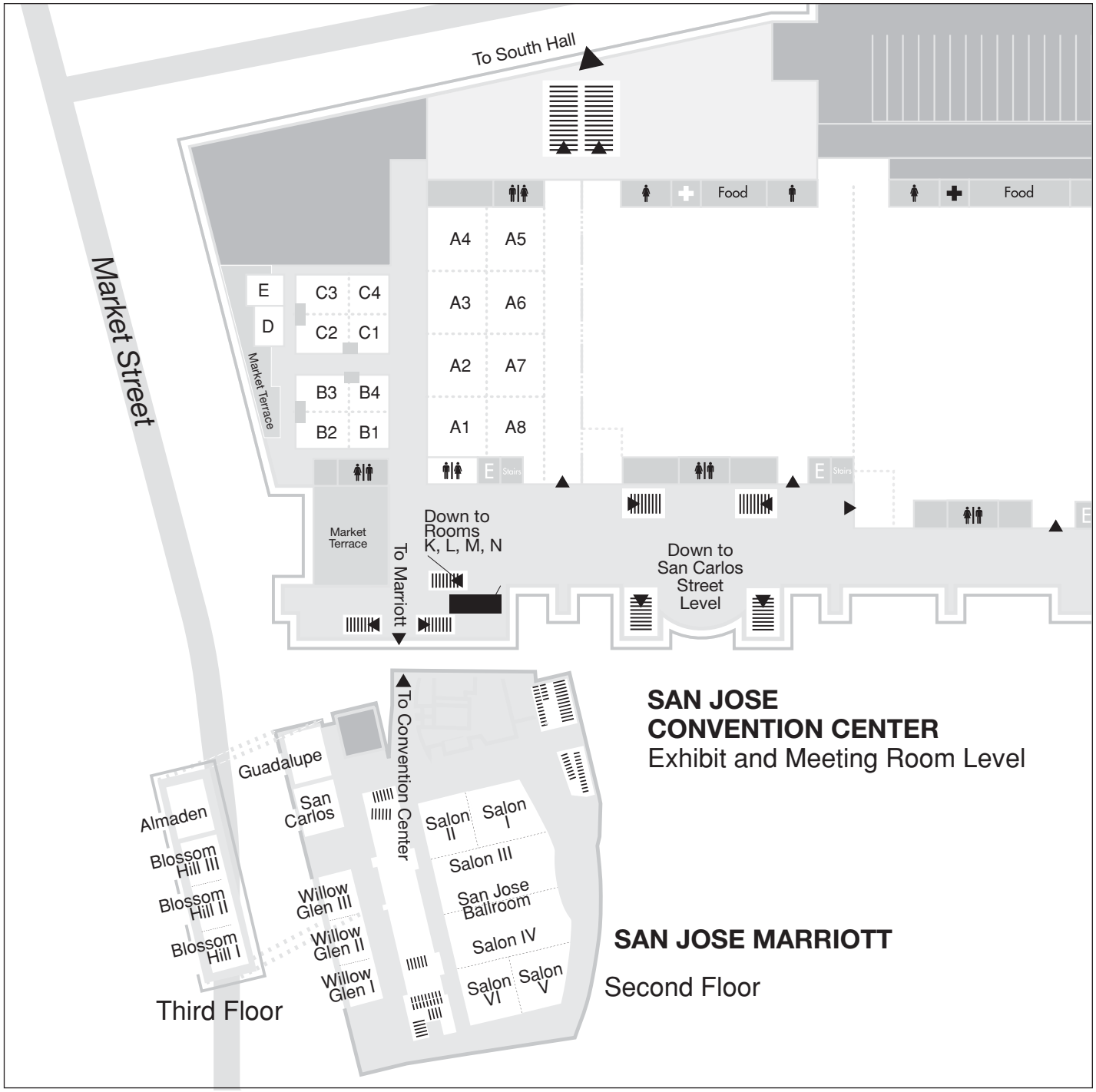
## SD&A 3D Theatre

Part of the Stereoscopic Displays and Applications conference but open to all attendees, this Monday evening 3D Theater will feature large-screen examples of how 3D video is being used and produced around the world. Program will be announced at the conference.

# Conference Daily Schedule

| Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|
| **3D Imaging, Interaction, and Measurement** | | | |
| Conf. 7237 **Stereoscopic Displays and Applications XX**, p. 14-18 | | | Conf. 7238 **The Engineering Reality of Virtual Reality 2009,** p. 19 |
| Conf. 7239 **3D Imaging Metrology,** p. 20-21 | | | |
| **Imaging, Visualization, and Perception** | | | |
| Conf. 7240 **Human Vision and Electronic Imaging XIV,** p. 22-25 | | | |
| | Conf. 7241 **Color Imaging XIV: Displaying, Hardcopy, Processing, and Applications**, p. 26-28 | | |
| Conf. 7242 **Image Quality and System Performance VI,** p. 29-31 | | | |
| Conf. 7243 **Visualization and Data Analysis 2009,** p. 32-33 | | | |
| **Image Processing** | | | |
| Conf. 7244 **Real-Time Image and Video Processing,** p. 34-35 | | | Conf. 7245B **Applications of Artificial Neural Networks in Image Processing XII,** p. 38 |
| Conf. 7245A **Image Processing: Algorithms and Systems VIII,** p. 36-37 | | | |
| Conf. 7246 **Computational Imaging VII,** p. 39-40 | | | |
| | Conf. 7247 **Document Recognition and Retrieval XVI,** p. 41-42 | | |
| | | Conf. 7248 **Wavelet Application in Industrial Processing VI**, p. 43-44 | |
| **Digital Image Sensors and Applications** | | | |
| Conf. 7250 **Digital Photography V**, p. 48-49 | | Conf. 7249 **Sensors, Cameras, and Systems for Industrial/Scientific Applications X**, p. 45-47 | |
| Conf. 7252 **Intelligent Robots and Computer Vision XXVI: Algorithms and Techniques**, p. 52-53 | | Conf. 7251 **Image Processing: Machine Vision Applications II**, p. 50-51 | |
| **Multimedia Processing and Applications** | | | |
| Conf. 7253 **Multimedia Computing and Networking 2009**, p. 54 | | | |
| Conf. 7254 **Media Forensics and Security XI**, p. 55-57 | | | |
| Conf. 7256 **Multimedia on Mobile Devices 2009**, p. 60-61 | | Conf. 7255 **Multimedia Content Access: Algorithms and Systems III**, p. 58-59 | |
| **Visual Communications and Image Processing** | | | |
| | Conf. 7257 **Visual Communications and Image Processing 2009**, p. 62-65 | | |

# Meeting Room Locations



## Electronic Imaging 2009

San Jose Convention Center
408 S. Almaden Boulevard, San Jose, CA 95110
San Jose Marriott Hotel
301 S. Market Street, San Jose, CA 95113

## Registration Hours

*San Jose Convention Center, Concourse 1 Lobby*

Course Attendees Only:
Sunday 18 January . . . . . 7:00 am to 10:00 am

Conference + Course Registration and Badge Pickup:
Sunday 18 January . . . . . 10:00 am to 4:00 pm
Monday 19 January . . . . . 7:00 am to 4:00 pm
Tuesday 20 January . . . . . 7:30 am to 4:00 pm
Wednesday 21 January . . . . . 7:30 am to 4:00 pm
Thursday 22 January . . . . . .7:00 am to Noon

## Registration

Full conference registration includes: Admittance to all symposium conferences, the interactive paper and demonstration session, the exhibit, coffee breaks, All-Conference Reception, and applicable EI proceedings.

## Speaker AV Prep Room and Hours

*San Jose Convention Center, Room E*

Sunday 18 January. . . . . 7:00 am to 5:00 pm
Monday 19 January . . . . . 7:00 am to 5:00 pm
Tuesday, 20 January . . . . . 7:00 am to 4:30 pm
Wednesday 21 January . . . . . 7:00 am to 4:30 pm
Thursday 22 January . . . . . 7:00 am to 2:00 pm

Speakers are encouraged to preview their materials in the Audio Visual Prep Room prior to their presentation. Speakers who have requested special equipment beyond an LCD projector that will work with their laptop are asked to report to the AV Prep Room upon arrival at the symposium to confirm equipment requests.

## Short Courses and Notes

Short courses will take place in various meeting rooms at the San Jose Marriott Hotel and San Jose Convention Center. Room assignments are noted on the course admission tickets and distributed with registration materials. Short course registrants exchange course tickets for course notes in the classroom where the course is held.

## Video/Digital Recording Policy

For copyright reasons, audio or video recording of any technical session, short course, or the Interactive Paper/Demonstration session is strictly prohibited without the prior written consent of each presenter recorded. Individuals not complying with this policy will be asked to leave a given session and to surrender their film or disc. It is the responsibility of the presenter to notify the conference sponsors if such consent is given.

## Message Board

There will be a message board next to the conference registration desk. Attendees are asked to check the board daily for any messages. Messages for attendees can be left by calling the IS&T/SPIE Message Center at 408-271-6100. Messages will be taken during registration hours Sunday through Thursday.

## Business Services

At the San Jose Marriott, attendees may use their hotel room key to access the on-site Business Center which offers use of a free on-line computer. Copies are free for the first 20 copies, 15 cents per page after. The fax machine is $1.00 per page for outgoing domestic usage and $3.00 per page for international usage. Incoming faxes are charged a $3.00 flat fee.

## Internet Access

IS&T/SPIE are pleased to provide complimentary wireless access for all conference attendees with wireless-enabled laptop computers or PDAs. SSID: EI2008, WEP: Disabled, Network card settings: DHCP

The San Jose Marriott offers its Wired for BusinessTM services in each guest room. For a daily charge of $12.95 you receive unlimited local and domestic long-distance calls and unlimited high-speed Internet access.

Properly secure your computer before accessing the public wireless network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and/or presentation.

## IS&T Bookstore and Membership Booth

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.

## Cash Cart: Breakfast Breads, Snacks, and Quick Lunch

*San Jose Convention Center, Concourse 1 Lobby*

Monday-Thursday . . . . . 7:30 am to 2:30 pm

The Cash Cart will offer breakfast breads, yogurt, fruit, coffee, juice, and other beverages each morning of the conference. Luncheon and snack service will include deli-style sandwiches, salads, snacks, pastries, and beverages.

## Child Care Services

A few child sitting services available in San Jose are as follows.
1. Bay Area 2nd MOM Inc., Hotel Nanny Service, Toll Free Phone: 1-888-926-3666, or (650) 858-2469, ext. 109. Fax: (650) 493-6598, Email: oncall@2ndmom.com or parentcounselor@2ndmom.com, Website: www.2ndmom.com
2. Sitters Unlimited: Toll Free Phone: (408) 452-0225, E-mail: info@bayareasittersunlimited.com or www.bayareasittersunlimited.com
Note: SPIE does 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.

## Car Rental

Hertz Car Rental has been selected as the official car rental agency for this Symposium. To reserve a car, identify yourself as an Electronic Imaging Conference attendee using the Hertz Meeting Code CV# 029B0012. Note: When booking from International Hertz locations, the CV # must be entered with the letters CV before the number, i.e. CV029B0012. Call 1-800-654-2240.

# 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, $520 / $620 | | | ***NEW*** SC927 **3D Imaging** *(Agam)* 8:30 am to 12:30 pm, $315 / $365 | |
| **Digital Imaging Sensors and Applications** | | | | |
| SC870 **Color Processing and its Characterisation for Digital Photography** *(Matherson, Wueller)* 8:30 am to 12:30 pm, $315 / $365 | SC504 **Introduction to CCD and CMOS Imaging Sensors and Applications** *(Janesick)* 8:30 am to 5:30 pm, $640 / $740 | ***NEW*** SC916 **Digital Camera and Sensor Evaluation Using Photon Transfer** *(Janesick)* 8:30 am to 5:30 pm, $565 / $665 | ***NEW*** SC929 **Digital Photographic Technology** *(Kriss)* 8:30 am to 5:30 pm, $520 / $620 | SC762 **Device Simulation for Image Quality Evaluation** *(Farrell, Catrysse)* 8:30 am to 12:30 pm, $315 / $365 |
| SC807 **Digital Camera and Scanner Performance Evaluation: Science, Standards and Software** *(Burns, Williams)* 8:30 am to 5:30 pm, $520 / $620 | | | | |
| SC871 **Noise, Image Processing, and their Influence on Resolution** *(Matherson, Wueller)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| SC812 **Perceptual Metrics for Image Quality Evaluation** *(Pappas, Hemami)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| **Image Processing** | | | | |
| SC870 **Color Processing and its Characterisation for Digital Photography** *(Matherson, Wueller)* 8:30 am to 12:30 pm, $315 / $365 | ***NEW*** SC928 **FPGA Design of Video and Image Processing Algorithms** *(Choo)* 8:30 am to 5:30 pm, $520 / $620 | SC766 **Information Processing for Video Surveillance** *(Ebrahimi, Dufaux)* 8:30 am to 5:30 pm, $520 / $620 | | |
| SC807 **Digital Camera and Scanner Performance Evaluation: Science, Standards and Software** *(Burns, Williams)* 8:30 am to 5:30 pm, $520 / $620 | SC813 **MPEG Family of Video Compression Standards** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | | | |
| SC468 **Image Enhancement and Deblurring** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | ***NEW*** SC930 **Optimizing Color Reproduction Systems** *(Marcu)* 8:30 am to 12:30 pm, $315 / $365 | | | |
| SC871 **Noise, Image Processing, and their Influence on Resolution** *(Matherson, Wueller)* 1:30 to 5:30 pm, $315 / $365 | SC516 **Color for Liquid Crystal Displays** *(Marcu)* 1:30 to 5:30 pm, $315 / $365 | | | |
| SC812 **Perceptual Metrics for Image Quality Evaluation** *(Pappas, Hemami)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| SC809 **Real-Time Image and Video Processing** *(Kehtarnavaz)* 8:30 am to 12:30 pm, $315 / $365 | | | | |
| **Security and Surveillance Applications** | | | | |
| SC468 **Image Enhancement and Deblurring** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | SC813 **MPEG Family of Video Compression Standards** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | SC766 **Information Processing for Video Surveillance** *(Ebrahimi, Dufaux)* 8:30 am to 5:30 pm, $520 / $620 | ***NEW*** SC929 **Digital Photographic Technology** *(Kriss)* 8:30 am to 5:30 pm, $520 / $620 | SC762 **Device Simulation for Image Quality Evaluation** *(Farrell, Catrysse)* 8:30 am to 12:30 pm, $315 / $365 |
| SC809 **Real-Time Image and Video Processing** *(Kehtarnavaz)* 8:30 am to 12:30 pm, $315 / $365 | ***NEW*** SC928 **FPGA Design of Video and Image Processing Algorithms** *(Choo)* 8:30 am to 5:30 pm, $520 / $620 | | | |
| SC812 **Perceptual Metrics for Image Quality Evaluation** *(Pappas, Hemami)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| SC872 **Media Forensics—New Perspectives of Sensometrics and Tamper Detection** *(Creutzburg),* 1:30 to 5:30 pm, $315 / $365 | | | | |
| ***NEW*** SC926 **Secure Multimedia Communication & Systems** *(Agaian)* 8:30 am to 5:30 pm, $520 / $620 | | | | |

# Course Daily Schedule

| Sunday | Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|---|
| **Imaging, Visualization, and Perception** | | | | |
| SC870 **Color Processing and its Characterisation for Digital Photography** *(Matherson, Wueller)* 8:30 am to 12:30 pm, $315 / $365 | SC813 **MPEG Family of Video Compression Standards** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | | ***NEW*** SC927 **3D Imaging** *(Agam)* 8:30 am to 12:30 pm, $315 / $365 | |
| SC807 **Digital Camera and Scanner Performance Evaluation: Science, Standards and Software** *(Burns, Williams)* 8:30 am to 5:30 pm, $520 / $620 | ***NEW*** SC930 **Optimizing Color Reproduction Systems** *(Marcu)* 8:30 am to 12:30 pm, $315 / $365 | | | |
| SC468 **Image Enhancement and Deblurring** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | SC516 **Color for Liquid Crystal Displays** *(Marcu)* 1:30 to 5:30 pm, $315 / $365 | | | |
| SC060 **Stereoscopic Display Application Issues** *(Merritt, Woods)* 8:30 am to 5:30 pm, $520 / $620 | | | | |
| SC899 **Visual Ergonomics and Aesthetics in Electronic Imaging** *(van Nes)* 8:30 am to 12:30 pm, $315 / $365 | | | | |
| SC871 **Noise, Image Processing, and their Influence on Resolution** *(Matherson, Wueller)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| SC812 **Perceptual Metrics for Image Quality Evaluation** *(Pappas, Hemami)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| **Multimedia Processing and Applications** | | | | |
| SC809 **Real-Time Image and Video Processing** *(Kehtarnavaz)* 8:30 am to 12:30 pm, $315 / $365 | SC813 **MPEG Family of Video Compression Standards** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | SC766 **Information Processing for Video Surveillance** *(Ebrahimi, Dufaux)* 8:30 am to 5:30 pm, $520 / $620 | | |
| SC812 **Perceptual Metrics for Image Quality Evaluation** *(Pappas, Hemami)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| ***NEW*** SC926 **Secure Multimedia Communication & Systems** *(Agaian)* 8:30 am to 5:30 pm, $520 / $620 | | | | |
| SC872 **Media Forensics - New Perspectives of Sensometrics and Tamper Detection** *(Creutzburg)* 1:30 to 5:30 pm, $315 / $365 | | | | |
| **Visual Communications and Image Processing** | | | | |
| SC807 **Digital Camera and Scanner Performance Evaluation: Science, Standards and Software** *(Burns, Williams)* 8:30 am to 5:30 pm, $520 / $620 | SC813 **MPEG Family of Video Compression Standards** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | | ***NEW*** SC927 **3D Imaging** *(Agam)* 8:30 am to 12:30 pm, $315 / $365 | |
| SC468 **Image Enhancement and Deblurring** *(Rabbani)* 8:30 am to 5:30 pm, $520 / $620 | | | | |
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**Course descriptions at registration desk.**

**Register for Courses on-site!**

# Conference 7237

Monday-Wednesday 19-21 January 2009 • Proceedings of SPIE Vol. 7237

# Stereoscopic Displays and Applications XX

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*Conference Chairs:* **Andrew J. Woods,** Curtin Univ. of Technology (Australia); **Nicolas S. Holliman,** Durham Univ. (United Kingdom); **John O. Merritt,** The Merritt Group

*Program Committee:* **Neil A. Dodgson,** Univ. of Cambridge (United Kingdom); **Gregg E. Favalora,** Actuality Medical, Inc.; **Takashi Kawai,** Waseda Univ. (Japan); **Janusz Konrad,** Boston Univ.; **Shojiro Nagata,** Japan 3D Forum/InterVision (Japan); **Vivian K. Walworth,** Jasper Associates; **Chris Ward,** Lightspeed Design, Inc.; **Michael A. Weissman,** TrueVision Systems

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room A1/A8: . . . . . .Mon. 8:30 to 10:10 am**

### Applications of Stereoscopy

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

8:30 am: **From bench to bedside: stereoscopic imaging in experimental and clinical otology**, Justus F. R. Ilgner M.D., Slavomir Biedron, Manfred Bovi, Univ. Hospital Aachen (Germany); Elena Fadeeva, Laser Zentrum Hannover e.V. (Germany); Martin Westhofen M.D., Univ. Hospital Aachen (Germany) . [7237-01]

8:50 am: **Stereoscopic display technologies and rendering approaches for neurosurgical visualization**, Jeremy R. Cooperstock, Guang-Yu Wang, McGill Univ. (Canada) . . . . . [7237-02]

9:10 am: **Case study: using a stereoscopic display for mission planning**, Michael Kleiber, Carsten Winkelholz, Research Establishment for Applied Science (Germany) . . . . . [7237-03]

9:30 am: **Three-dimensional vision system assessment**, J. Larry Pezzaniti, Richard Edmondson, David B. Chenault, Polaris Sensor Technologies, Inc. (United States); David Kingston, Concurrent Technologies Corp. (United States); Brad Pettijohn, Army Research Lab. (United States) . . . . . [7237-04]

9:50 am: **Autostereoscopic display of large-scale scientific visualization**, Tom Peterka, Robert Ross, Argonne National Lab. (United States); Hongfeng Yu, Sandia National Labs. (United States); Kwan-Liu Ma, Univ. of California, Davis (United States) . . . . . [7237-05]

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

### SESSION 2

**Conv. Ctr. Room A1/A8: . . . . . .Mon. 10:40 am to 12:00 pm**

### Multiview and Lightfield Technologies

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

10:40 am: **Spatial-angular analysis of displays for reproduction of light fields**, Amir Said, Hewlett-Packard Co. (United States); Eino-Ville Talvala, Stanford Univ. (United States) . . . . . [7237-06]

11:00 am: **Flat-panel display with slanted pixel arrangement for 16-view display**, Yasuhiro Takaki, Tokyo Univ. of Agriculture and Technology (Japan); Osamu Yokoyama, Goro Hamagishi, Seiko Epson Fujimi (Japan) . . . . . [7237-07]

11:20 am: **High-density light field reproduction using overlaid multiple projection images**, Masami Yamasaki, Takafumi Koike, Kei Utsugi, Hideyuki Sakai, Hitachi, Ltd. (Japan) . . . . . [7237-08]

11:40 am: **Calibrating camera and projector arrays for immersive 3D display**, Harlyn Baker, Hewlett-Packard Co. (United States); Zeyu Li, Univ. of California, Berkeley (United States); Constantin Papadas, Integrated Systems Development S.A. (Greece) . . . . . [7237-09]

Lunch Break . . . . . 12:00 to 1:30 pm

### Lunch Time Round Table Discussion

An informal discussion of various topics over lunch. The topic for each day will be announced at the conference. Grab some lunch and meet at the reserved table near the SD&D conference room - limited numbers.

## SESSION 3

**Conv. Ctr. Room A1/A8: . . . . . .Mon. 1:30 to 3:10 pm**

### Digital 3D Stereoscopic Entertainment I

*Session Chair*: **Andrew J. Woods,** Curtin Univ. of Technology (Australia)

1:30 pm: **U23D: a case study in stereoscopic live action image acquisition and the post production pipeline**, Steve Schklair, 3ality Digital LLC (United States) . . . . . [7237-10]

1:50 pm: **Three-dimensional television: a broadcaster's perspective**, Stephen J. E. Jolly, Richard Salmon, Michael Armstrong, British Broadcasting Corp. (United Kingdom). . . . . [7237-11]

2:10 pm: **Digital stereoscopic CG camera rig and associated metadata for film production**, S. Sylwan, J. D. Walter, D. MacDonald, Autodesk, Inc. (United States) . . . . . [7237-114]

2:30 pm: **A modular projection autostereoscopic system for stereo cinema**, Victor A. Elkhov, Nikolai V. Kondratiev, Yuri N. Ovechkis, Larisa A. Pautova, NIKFI (Russia) . . . . . [7237-67]

2:50 pm: **Stereoscopic convergence in home video and gaming**, Ethan D. Schur, TDVision Sytems, Inc. (United States) . . . . . [7237-14]

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

## SESSION 4

**Conv. Ctr. Room A1/A8: . . . . . .Mon. 3:40 to 5:20 pm**

### Digital 3D Stereoscopic Entertainment II

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

3:40 pm: **Bolt 3D: a case study,** R. Neuman, The Walt Disney Co. (United States) . . . . . [7237-115]

4:00 pm: **State of the art in stereoscopic movies production workflow**, Bernard Mendiburu, Insight Media (United States); Ray Zone, The 3-D Zone (United States). . . . . [7237-16]

4:20 pm: **Optimising 3D image quality and performance for stereoscopic game drivers**, Julien C. Flack, Hugh Sanderson, Steven I. Pegg, Simon Kwok, Dynamic Digital Depth Australia Pty. Ltd. (Australia) . . . . . [7237-17]

4:40 pm: **Evaluating methods for controlling depth perception in stereoscopic cinematography**, Geng Sun, Nicolas S. Holliman, Durham Univ. (United Kingdom). . . . . [7237-18]

5:00 pm: **Publishing stereoscopic images**, Ron Labbe, Studio 3D (United States) . . . . . [7237-19]

Session Break . . . . . 5:20 to 5:30 pm

**Mon. 5:30 to 7:30 pm**

**3D Theatre**

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

See large-screen examples of how 3D video is being used and produced around the world.

Program announced at the conference.

**Mon. 7:45 to 10:00 pm**

**SD&A 20th Anniversary Banquet**

Acelebration of 20 years of the SD&A conference to be held at a local San Jose Restaurant. Details available at the conference.

# Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

*Sessions 6 and 9 run concurrently.*

## SESSION 6

**Conv. Ctr. Room A1/A8: . . . . . .Tues. 10:30 to 11:30 am**

### Stereoscopic Human Factors

*Session Chair*: **John O. Merritt,** The Merritt GroupSessions 6 and 9 run concurrently.

10:30 am: **Measuring visual discomfort associated with 3D displays**, Marc Lambooij, Marten Fortuin, Wijnand A. Ijsselsteijn, Eindhoven University of Technology (Netherlands); Ingrid E. J. Heynderickx, Philips Research (Netherlands) . . . . . [7237-21]

10:50 am: **Evaluation of stereoscopic 3D displays for image analysis tasks**, Elisabeth Peinsipp-Byma, Ralf Eck, Nils Rehfeld, Fraunhofer-Institut für Informations-und Datenverarbeitung (Germany). . . . . [7237-22]

11:10 pm: **Binocular coordination in response to stereoscopic stimuli**, Simon P. Liversedge, Univ. of Southampton (United Kingdom); Nicolas S. Holliman, Durham Univ. (United Kingdom); Hazel I. Blythe, Univ. of Southampton (United Kingdom) . . . . . [7237-23]

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

## SESSION 9

**Conv. Ctr. Room A7: . . . . . .Tues. 10:30 to 11:30 am**

### Stereoscopic Developments I

*Session Chair*: **Vivian K. Walworth,** Jasper AssociatesSessions 6 and 9 run concurrently.

10:30 am: **Effect of light ray overlap between neighboring parallax images in autostereoscopic 3D displays**, Rieko Fukushima, Kazuki Taira, Tatsuo Saishu, Yoshiharu Momonoi, Masako Kashiwagi, Yuzo Hirayama, Toshiba Corp. (Japan). . . . . [7237-34]

11:00 am: **Shutter glasses stereo LCD with a scanning backlight**, Jian-Chiun Liou, Kuen Lee, Industrial Technology Research Institute (Taiwan); Fan-Gang Tseng, National Tsing Hua Univ. (Taiwan); Jui-Feng Huang, Industrial Technology Research Institute (Taiwan) . . . . . [7237-35]

11:10 pm: **Experiments in flat stereoscopy**, Perry Hoberman, Univ. of Southern California (United States). . . . . [7237-36]

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

## SESSION 5

**Conv. Ctr. Room A1/A8: . . . . . Tues. 11:30 to 12:30 am**

### Keynote Presentation

*Session Chair*: **Andrew J. Woods,** Curtin Univ. of Technology (Australia)

### Archimedes' Tub

**Lenny Lipton,** CTO, REAL D

As a boy I was fascinated by the story I read about Archimedes and his epiphany in the tub. I've fulfilled my dream of becoming an inventor and have had many an epiphany including how to eliminate flicker from time sequential 3-D displays, ideas for improving electro-optics such as the first CrystalEyes shutters, and the basis for the modern theatrical 3-D projection system. I also realized that perfecting the display system wasn't enough and that the content had to be properly prepared and set about figuring that out over several years of experimentation. My book, Foundations of the Stereoscopic Cinema, enunciates what is now the standard theory of stereoscopic composition as well as describing the overarching design principal of such displays -- the principal of binocular symmetries. The talk will cover people and events that influenced me including my more than 25 year participation in the SD&A conference and its predecessors.

**Lenny Lipton** was born in New York City and graduated from Cornell University, where he majored in physics. He has authored three books for Simon & Schuster, including Independent Filmmaking, which was the early standard text in many film schools and remained in print for 20 years. He founded StereoGraphics Corporation in 1980 which was responsible for the well known CrystalEyes and ZScreen products. Lenny is Chief Technology Officer of Real D, which acquired StereoGraphics in 2005. At REAL D Lenny helped perfect the Real D projection system, which has become the leading 3D cinema technology.

### Lunch Time Round Table Discussion

An informal discussion of various topics over lunch. The topic for each day will be announced at the conference. Grab some lunch and meet at the reserved table near the SD&D conference room - limited numbers.

*Sessions 7 and 10 run concurrently.*

## SESSION 7

**Conv. Ctr. Room A1/A8: . . . . . Tues. 2:00 to 3:40 pm**

### 3D Displays

*Session Chair*: **Gregg E. Favalora,** Actuality Systems, Inc.Sessions 7 and 10 run concurrently.

2:00 pm: **The compatibility of LCD TVs with time-sequential stereoscopic 3D visualization**, Andrew J. Woods, Adin Sehic, Curtin Univ. of Technology (Australia). . . . . [7237-24]

2:20 pm: **Color holographic reconstruction using multiple SLMs and LED illumination**, Fahri Yaras, Levent Onural, Bilkent Univ. (Turkey) . . . . . [7237-25]

2:40 pm: **Review of wire grid polarizer and retarder for stereoscopic display**, Sung J. Lee, Pavonine, Inc. (Korea, Republic of) . . . . . [7237-26]

3:00 pm: **High quality stereoscopic rendering on 120 Hz LCD panels**, Gerrit Slavenburg, David R. Cook, NVIDIA Corp. (United States). . . . . [7237-91]

3:20 pm: **A novel volumetric display with temporally multiplexed focal cues**, David M. Hoffman, Martin S. Banks, Univ. of California, Berkeley (United States); Philip J. W. Hands, Andrew K. Kirby, Gordon D. Love, Durham Univ. (United Kingdom). . . . . [7237-28]

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

## SESSION 10

**Conv. Ctr. Room A7: . . . . . .Tues. 2:00 to 3:40 pm**

### 3D Image Processing and Image Quality

*Session Chair*: **Janusz Konrad,** Boston Univ.Sessions 7 and 10 run concurrently.

2:00 pm: **A new way to characterize autostereoscopic 3D displays using Fourier optics instrument**, Pierre M. Boher, Thierry R. Leroux, Thibault Bignon, ELDIM (France) . . . . . [7237-37]

2:20 pm: **Effects of sampling in depth control method for integral imaging system**, Jun Arai, Masahiro Kawakita, Fumio Okano, NHK Science & Technical Research Labs. (Japan). . . . . [7237-38]

2:40 pm: **A multi-objective optimization framework for subjectively optimized stereoscopic video coding**, Eran A. Edirisinghe, Muhammad A. Ismail, Loughborough Univ. (United Kingdom). . . . . [7237-39]

3:00 pm: **Compressed stereoscopic video quality metric**, Jungdong Seo, Kwanghoon Sohn, Yonsei Univ. (Korea (Republic of)) . . . . . [7237-40]

3:20 pm: **Spatial and temporal coherent occlusion generation**, Rene Klein Gunnewiek, Robert-Paul Berretty, Bart Barenbrug, Philips Research (Netherlands) . . . . . [7237-54]

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

*Sessions 8 and 11 run concurrently.*

## SESSION 8

**Conv. Ctr. Room A1/A8: . . . . . Tues. 4:10 to 5:50 pm**

### Autostereoscopic Displays

*Session Chair*: **Nicolas S. Holliman,** Durham Univ. (United Kingdom) Sessions 8 and 11 run concurrently.

4:10 pm: **Large real-time holographic displays: from prototypes to a consumer product**, Ralf Häussler, Armin Schwerdtner, Norbert Leister, Stephan Reichelt, Gerald Fütterer, Grigory Lazarev, Steffen Buschbeck, Stanislas Flon, Hagen Sahm, SeeReal Technologies GmbH (Germany). . . . . [7237-29]

4:30 pm: **High-definition integral floating display with multiple spatial light modulators**, Joohwan Kim, Jae-Hyun Jung, Keehoon Hong, James Lim, Youngmin Kim, Joonku Hahn, Seoul National Univ. (Korea, Republic of); Sung-Wook Min, Kyung Hee Univ. (Korea, Republic of); Byoungho Lee, Seoul National Univ. (Korea, Republic of) . . . . . [7237-30]

4:50 pm: **OLED backlight for autostereoscopic displays**, Uwe Vogel, Lars Kroker, Jens Knobbe, Christiane Grillberger, Jörg Amelung, Michael Scholles, Fraunhofer-Institut für Photonische Mikrosysteme (Germany) . . . . . [7237-31]

5:10 pm: **Moving parallax barrier with a 3D tracker**, SeungHyun Lee, HoByung Chae, HyungChul O. Li, Keetak Kham, Kwangwoon Univ. (Korea (Republic of)) . . . . . [7237-32]

5:30 pm: **Reflection holograms as autostereoscopic projection screens**, Stanislovas J. Zacharovas, Ramunas J. Bakanas, Evgenij A. Kuchin, Geola Technologies Ltd. (Lithuania) . . . . . [7237-33]

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

## SESSION 11

**Conv. Ctr. Room A7: . . . . . .Tues. 4:10 to 5:50 pm**

### Stereoscopic Developments II

*Session Chair*: **Takashi Kawai,** Waseda Univ. (Japan)Sessions 8 and 11 run concurrently.

4:10 pm: **Stereoscopy in cinematographic synthetic imagery**, Johathan Eisenmann, Rick Parent, The Ohio State Univ. (United States) . . . . . [7237-42]

4:30 pm: **Compressive acquisition of ray-space using radon transform**, Keiji Yamashita, Tomohiro Yendo, Masayuki Tanimoto, Nagoya Univ. (Japan); Toshiaki Fujii, Tokyo Institute of Technology (Japan) . . . . . [7237-43]

4:50 pm: **The effect of 2D/3D environment on decision making**, Shabtay Negry, Tel-Aviv Univ. (Israel) . . . . . [7237-44]

5:10 pm: **Some experiments about shape perception in stereoscopic displays**, Laure Leroy, Alexis Paljic, Philippe Fuchs, Ecole des Mines de Paris (France); Guillaume Moreau, Ecole Centrale de Nantes (France) . . . . . [7237-45]

5:30 pm: Depth and distance perception in a curved, large screen virtual reality installation, Davide Gadia, Univ. degli Studi di Milano (Italy); Alessandra Galmonte, Univ. degli Studi di Verona (Italy); Alberto Viale, Daniele Marini, Univ. degli Studi di Milano (Italy) . . . . . [7237-46]

**San Jose Convention Center,**
**Exhibit Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### SD&A Demonstration Session

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

A symposium-wide demonstration session open to all attendees. Demonstrators will provide interactive, hands-on demonstrations of a wide range of products related to Electronic Imaging. This year's demonstration session is again a combined event with the entire Electronic Imaging Symposium demonstration session, which will have a focused "Stereoscopic Dispplays & Applications" section.

The demonstration session houses a vast collection of electronic stereoscopic displays - there's no better way to to witness so many stereoscopic displays with your own two eyes than at this one session!

**San Jose Convention Center,**
**Exhibit Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Application of stereoscopic arc photogrammetry to image-guided radiation therapy and treatment planning**, Collin D. Brack, Ivan L. Kessel M.D., The Univ. of Texas Medical Branch at Galveston (United States). . . . . [7237-57]

**Temporal sub-sampling of depth maps in depth image-based rendering of stereoscopic image sequences**, Wa James Tam, Filippo Speranza, Carlos Vázquez, Liang Zhang, Communications Research Ctr. Canada (Canada) . . . . . [7237-58]

**Indirect ophthalmoscopic stereo video system using three-dimensional LCD**, Hyoun-Joong Kong, Seoul National Univ. College of Medicine (Korea, Republic of); Jong Mo Seo M.D., Seoul National Univ. (Korea, Republic of); Jeong Min Hwang M.D., Seoul National Univ. College of Medicine (Korea, Republic of); Hee Chan Kim, Seoul National Univ. College of Medicine (Korea, Republic of) and Seoul National Univ. (Korea, Republic of) . . . . . [7237-59]

**Stereoscopic camera system with creator-friendly functions**, Shinsuke Kishi, Nobuaki Abe, Takashi Shibata, Takashi Kawai, Waseda Univ. (Japan); Makoto Maeda, Kouichi Hoshi, Flovel Co., Ltd. (Japan) . . . . . [7237-60]

**Real-time feeding of image data to the cylindrical 3D display 'Seelinder'**, Tomohiro Yendo, Masayuki Tanimoto, Nagoya Univ. (Japan) . . . . . [7237-61]

**The development of the integrated-screen autostereoscopic display system**, Wei-Liang Hsu, Wu-Li Chen, Chao-Hsu Tsai, Chy-Lin Wang, Chang-Shuo Wu, Shu-Chuan Cheng, Industrial Technology Research Institute (Taiwan) . [7237-62]

**On a method to evaluate motion sickness induced by stereoscopic images on HMD**, Hiroki Takada, Gifu Univ. of Medical Science (Japan); Kazuhiro Fujikake, The Institute for Science of Labour (Japan); Tomoki Watanabe, Aichi Gakuin Univ. (Japan); Satoshi Hasegawa, Nagoya Bunri Univ. (Japan); Masako Omori, Kobe Women's Univ. (Japan); Masaru Miyao, Nagoya Univ. (Japan) . . . . . [7237-63]

**Dense light field microscopy**, Youngtae Lim, Chungbuk National Univ. (Korea (Republic of)); Jae-hyeung Park, Chungbuk National Univ. (Korea, Republic of); Nam Kim, Chungbuk National Univ. (Korea (Republic of)) . . . . . [7237-65]

**A common interface for stereo display in multiple environments**, Oleg Pariser, Robert G. Deen, Jet Propulsion Lab. (United States) and California Institute of Technology (United States) . . . . . [7237-66]

**Resizing of stereoscopic images for display adaptation**, Wook-Joong Kim, Seong-Dae Kim, Korea Advanced Institute of Science and Technology (South Korea); Jinwoong Kim, Electronics and Telecommunications Research Institute (South Korea); Namho Hur, Electronics and Telecommunications Research Institute (Korea, Republic of) . . . . . [7237-71]

**Super multi-view display with 128 viewpoints and viewpoint formation**, Yasuhiro Takaki, Tokyo Univ. of Agriculture and Technology (Japan) . . [7237-72]

**A novel 2D-to-3D conversion technique based on relative height-depth-cue**, Yong Ju Jung, Aron Baik, DuSik Park, Samsung Advanced Institute of Technology (South Korea) . . . . . [7237-73]

**3D and 2D switchable display**, Michiyoshi Nagashima, Independent Consultant (Japan) . . . . . [7237-74]

**SOLIDFELIX: a transportable 3D static volume display**, Alexander Kreft, Henrik T. Wörden, Knut Langhans, Felix3D VFN e.V. (Germany) . . . . . [7237-75]

**High speed, large viewing angle liquid crystal for triple-flash shuttered glasses**, Jean-Louis M. de Bougrenet de la Tocnaye, TELECOM Bretagne (France) . . . . . [7237-77]

**Spatial-coding-based 2-D / 3-D / P-P display**, Hirotsugu Yamamoto, Shiro Suyama, Univ. of Tokushima (Japan) . . . . . [7237-78]

**Disparity maps based on binocular rivalry and affine transforms**, Rafik Bensalma, Chaker M. Larabi, Univ. de Poitiers (France). . . . . [7237-79]

**All in focus plane reconstruction based on integral imaging**, Ganbat Baasantseren, Jae-Hyeung Park, Nam Kim, Chungbuk National Univ. (Korea (Republic of)) . . . . . [7237-82]

**Hybrid depth cueing for 2D-to-3D conversion system**, Chao-Chung Cheng, Chung-Te Li, Yi-Min Tsai, Liang-Gee Chen, National Taiwan Univ. (Taiwan) . . . . . [7237-85]

**Optically Multilayered Light Field Display for Enhancing Depth of Field**, Takuro Wada, The Univ. of Tokyo (Japan); Takafumi Koike, The Univ. of Tokyo (Japan) and Hitachi, Ltd. (Japan); Takeshi Naemura, The Univ. of Tokyo (Japan) . . . . . [7237-86]

**Real-time rendering for integral photography that uses extended fractional view**, Kazuhisa Yanaka, Kanagawa Institute of Technology (Japan) . . . [7237-87]

**High-speed liquid-crystal optical deflector for 3-D display**, Shota Wakita, Univ. of Tokushima (Japan). . . . . [7237-88]

**The variance estimation and enhanced 3D sensing of heavy occluded objects using synthetic aperture integral imaging(SAII)**, Yong Seok Hwang, Eun-Soo Kim, Kwangwoon Univ. (Korea (Republic of)) . . . . . [7237-89]

**Improving image quality of coarse integral volumetric display**, Hideki Kakeya, Univ. of Tsukuba (Japan). . . . . [7237-90]

## Courses of Related Interest

*Register for courses on-site!*

SC060 Stereoscopic Display Application Issues (Merritt, Woods) Sunday, 8:30 am to 5:30 pm

## Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 12

**Conv. Ctr. Room A1/A8: . . . . . Wed. 9:30 to 10:30 am**

**2D to 3D Conversion**

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

9:30 am: **Depth map quality metric for three-dimensional video**, Donghyun Kim, Dongbo Min, Kwanghoon Sohn, Yonsei Univ. (Korea (Republic of))[7237-47]

9:50 am: **Three-dimensional TV: a novel method for generating surrogate depth maps using colour information**, Wa James Tam, Carlos A. Vázquez, Filippo Speranza, Communications Research Ctr. Canada (Canada) . . [7237-48]

10:10 am: **Unsupervised object segmentation for 2D to 3D conversion**, Matthias Kunter, Sebastian Knorr, imcube media, TU Berlin (Germany); Andreas Krutz, Thomas Sikora, Technische Univ. Berlin (Germany). . . . . [7237-49]

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

**Conv. Ctr. Room A1/A8: . . . . . Wed. 11:00 am to 12:00 pm**

**Discussion Forum I: Standards to enable ubiquitous 3D display**

To become ubiquitous, 3D display technologies will require flexible delivery standards, particularly if they are to support cinema, professional, home, and mobile use. We already know that the same stereo pair cannot bring high 3D quality to all these platforms, how can we solve this? Leading industry and academic experts will present their thoughts and answer your questions on these issues.

Panelists to be announced.

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

**Lunch Time Round Table Discussion**

An informal discussion of various topics over lunch. The topic for each day will be announced at the conference. Grab some lunch and meet at the reserved table near the SD&D conference room - limited numbers.

### SESSION 13

**Conv. Ctr. Room A1/A8: . . . . . Wed. 1:30 to 2:50 pm**

**3D on Mobile Devices**

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

1:30 pm: **Digital stereoscopic photography using Stereo Data Maker**, John S. Toeppen, Lawrence Livermore National Lab. (United States); David Sykes, Turin Networks, Inc. (United States). . . . . [7237-50]

1:50 pm: **Stereoscopic contents authoring system for 3D DMB data service**, BongHo Lee, KugkJin Yun, Namho Hur, Jinwoong Kim, Soo-In Lee, Electronics and Telecommunications Research Institute (Korea, Republic of) . . . . . [7237-51]

2:10 pm: **Evaluation of stereoscopic image quality for mobile devices using interpretation based quality methodology**, Takashi Shibata, Shunsuke Kurihara, Takashi Kawai, Waseda Univ. (Japan); Tsuyoshi Takahashi, Tomoyuki Shimizu, Ryoichi Kawada, Atsushi Ito, KDDI R&D Labs., Inc. (Japan); Jukka Häkkinen, Univ. of Helsinki (Finland) and Nokia Research Ctr. (Finland); Jari M. Takatalo, Göte S. Nyman, Univ. of Helsinki (Finland) . . . . . [7237-52]

2:30 pm: **Classification and simulation of stereoscopic artefacts in mobile 3DTV content**, Atanas R. Boev, Danilo Hollosi, Atanas P. Gotchev, Karen O. Egiazarian, Tampere Univ. of Technology (Finland) . . . . . [7237-53]

Coffee Break . . . . . 2:50 to 3:20 pm

### SESSION 14

**Conv. Ctr. Room A1/A8: . . . . . Wed. 3:20 to 4:20 pm**

**Depth Map Techniques**

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

3:20 pm: **Multi-layer image-and-depth with transparency made practical**, Bart Barenbrug, Philips Research (Netherlands). . . . . [7237-41]

3:40 pm: **Efficient and automatic stereoscopic videos to N views conversion for autostereoscopic displays**, David Alessandrini, Raphaèle Balter, Stéphane Pateux, Orange Labs. (France) . . . . . [7237-55]

**Depth camera for 3DTV applications**, Jinwoong Kim, Taeone Kim, Electronics and Telecommunications Research Institute (Korea (Republic of)); Wook-Joong Kim, Korea Advanced Institute of Science and Technology (Korea (Republic of)); Namho Hur, Electronics and Telecommunications Research Institute (Korea (Republic of)) . . . . . [7237-84]

Session Break . . . . . 4:20 to 4:30 pm

**Conv. Ctr. Room A1/A8: . . . . . Wed. 4:30 to 5:30 pm**

**Discussion Forum II: 3D Gaming: What's it going to take to go big time?**

*Panel Moderator:* **Neil Schneider,** MTBS 3D (Canada)

*Panel Members:* **Andrew Fear,** NVIDIA; **Bob Eminian,** iZ3D, LLC; **Julien Flack,** Dynamic Digital Depth (Australia); **Chris Ward,** Lightspeed Design, Inc.

3D gaming is undergoing many advancements in both display hardware and software, but how and when is 3D gaming really going to hit the big time? Hear industry leaders discuss this topic of wide interest to the stereoscopic imaging community.

**Conv. Ctr. Room A1/A8: . . . . . Wed. 5:30 to 5:40 pm**

**Closing Remarks**

# Conference 7238

Thursday 22 January 2009 • Proceedings of SPIE Vol. 7238

# The Engineering Reality of Virtual Reality 2009

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

## Thursday 22 January

### SESSION 1

**Conv. Ctr. Room B3: . . . . . .Thurs. 9:00 to 10:00 am**

#### Delightful Devices and Augmenting Reality

*Session Chair*: **Ian E. McDowall,** Fakespace Labs., Inc.

9:00 am: **Model-based registration of multi-rigid-body for augmented reality**, Sei Ikeda, Hajime Hori, Masataka Imura, Yoshitsugu Manabe, Kunihiro Chihara, Nara Institute of Science and Technology (Japan) . . . . . [7238-01]

9:20 am: **Automatic human detecting and tracking using stereo vision technique**, Yunqiu Wang, Gerald Morrison, Smart Technologies, Inc. (Canada) . . . . . [7238-02]

9:40 am: **Real-time geometric registration using feature landmark database for augmented reality applications**, Takafumi Taketomi, Tomokazu Sato, Naokazu Yokoya, Nara Institute of Science and Technology (Japan) . . [7238-03]

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

### SESSION 2

**Conv. Ctr. Room B3:. . . . . Thurs. 10:30 am to 12:10 pm**

#### Evoking Environments through Artful Distinctiveness

*Session Chair*: **Margaret Dolinsky,** Indiana Univ.

10:30 am: **A strategic map for high-impact virtual experience design**, Haakon Faste, Massimo Bergamasco, Scuola Superiore Sant'Anna (Italy). . . . . [7238-05]

10:50 am: **Computer graphics synthesis for inferring artist studio practice: an application to Diego Velázquez' 'Las Meñinas'**, David G. Stork, Ricoh Innovations, Inc. (United States) and Stanford Univ. (United States); Yasuo Furuichi, Consultant (United States) . . . . . [7238-06]

11:10 am: **Becoming Dragon, a mixed reality: durational performance in second life**, Micha Cardenas, Christopher Head, Univ. of California, San Diego (United States). . . . . [7238-07]

11:30 am: **Dots and dashes: art, virtual reality, and the telegraph**, Silvia Ruzanka, Univ. of Hartford (United States); Benjamin Chang, Art Institute of Chicago (United States) . . . . . [7238-08]

11:50 am: **Exploring the simulation requirements for virtual lumbar puncture training**, Vassilis Charissis, Univ. of Glasgow (United Kingdom); Sophia Sakellariou, Raigmore Hospital (United Kingdom); Benjamin M. Ward, David Rowley, The Royal College of Surgeons of Edinburgh (United Kingdom); Paul Anderson, Univ. of Glasgow (United Kingdom). . . . . [7238-09]

Lunch Break . . . . . 12:10 to 1:30 pm

### SESSION 3

**Conv. Ctr. Room B3:. . . . . .Thurs. 1:30 to 2:50 pm**

#### Feeling Aware: VR as Experience

*Session Chair*: **Margaret Dolinsky,** Indiana Univ.

1:30 pm: **Immersive urban outdoor experiences: case study LifeClipper2**, Helmar Burkhart, Martin Guggisberg, Oliver Koch, Florian Mueller, Juerg Senn, Univ. of Basel (Switzerland). . . . . [7238-10]

1:50 pm: **Using EEG to visualize brain waves in second life**, Isil Demir, Can Sen, Yigit Yuksel, Sabanci Univ. (Turkey) . . . . . [7238-11]

2:10 pm: **Re-entry: online virtual worlds for as a healing space for veterans**, Jacquelyn F. Morie, Univ. of Southern California (United States). . . . . [7238-12]

2:30 pm: **DJ Sim: a virtual reality DJ simulation game**, Corey Manders, Farzam Farbiz, A*STAR Institute for Infocomm Research (Singapore) . . . . . [7238-13]

Coffee . . . . . 2:50 to 3:20 pm

### SESSION 4

**Conv. Ctr. Room B3: . . . . . .Thurs. 3:20 to 5:20 pm**

#### Interactive Science and Virtual Observation

*Session Chair*: **Ian E. McDowall,** Fakespace Labs., Inc.

3:20 pm: **On the simulation of sensor network connectivity using radiosity and OGRE**, Bruce A. Johnson, Ben Huey, Brian Sharp, The Univ. of Tennessee (United States). . . . . [7238-14]

3:40 pm: **Interactive exploration of coastal restoration modeling in virtual environments**, Andreas Gerndt, German Aerospace Center (DLR) (Germany); Robert Miller, Fenstermaker & Associates, Inc. (United States); Simon Su, Louisiana Immersive Technologies Enterprise (United States); Ehab Meselhe, Univ. of Louisiana at Lafayette (United States); Carolina Cruz-Neira, Louisiana Immersive Technologies Enterprise (United States) . . . . . [7238-15]

4:00 pm: **Forensic aerial photography, projected 3D trial exhibits facilitating rapid environmental justice**, Robert A. Pope, Waterstone Environmental (United States) . . . . . [7238-16]

4:20 pm: **Virtual hydrology observatory: an immersive visualization of hydrology modeling**, Simon Su, Carolina Cruz-Neira, Louisiana Immersive Technologies Enterprise (United States); Emad Habib, Univ. of Louisiana at Lafayette (United States); Andreas Gerndt, German Aerospace Center (Germany) . . . . . [7238-17]

4:40 pm: **Sensate abstraction: hybrid strategies for multi-dimensional data in expressive virtual reality contexts**, Ruth G. West, Univ. of California, Los Angeles (United States); Todd Margolis, Joachim Gossmann, Univ. of California, San Diego (United States); Jurgen P. Schulze, University of California, San Diego (United States); J. P. Lewis, Weta Digital Ltd. (New Zealand); Ben S. Hackbarth, Iman Mostafavi, Univ. of California, San Diego (United States) . . . . . [7238-18]

5:00 pm: **Transforming pain**, Diane Gromala, Simon Fraser Univ., Surrey (Canada) . . . . . [7238-19]

## Courses of Related Interest

*Register for courses on-site!*

SC060 Stereoscopic Display Application Issues (Merritt, Woods) Sunday, 8:30 am to 5:30 pm

# Conference 7239

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7239

# 3D Imaging Metrology

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

*Program Committee:* **Burcu Akinci,** Carnegie Mellon Univ.; **Robert E. Bridges,** FARO Technologies Inc.; **Jan Böhm,** Univ. Stuttgart (Germany); **Simone Carmignato,** Univ. degli Studi di Padova (Italy); **Luc Cournoyer,** National Research Council Canada (Canada); **Sabry F. El-Hakim,** National Research Council Canada (Canada); **Guy Godin,** National Research Council Canada (Canada); **Darin Ingimarson,** Quantapoint; **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); **David Ober,** ; **Norbert Pfeifer,** Technische Univ. Wien (Austria); **Steven D. Phillips,** National Institute of Standards and Technology; **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 Inst. for Geo-Information Science and Earth Observation (Netherlands); **Gregory C. Walsh,** Leica Geosystems HDS, LLC

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room L: . . . . . .Mon. 9:00 to 10:00 am**

**Theory and New Methods for 3D Surface Sensing I**

*Session Chair*: **Geraldine S. Cheok,** National Institute of Standards and Technology

9:00 am: **Basic theory on surface measurement uncertainty of 3D imaging systems**, J. Angelo Beraldin, National Research Council Canada (Canada) . . . . . [7239-01]

9:20 am: **Design and implementation of an inexpensive lidar scanning system with applications in archaeology and anthropology**, Andrew R. Willis, Yunfeng Sui, The Univ. of North Carolina at Charlotte (United States); William Ringle, Davidson College (United States); Katherina Galor, Brown Univ. (United States) . . . . . [7239-02]

9:40 am: **Range imager performance comparison in homodyne and heterodyne operating modes**, Richard M. Conroy, Adrian A. Dorrington, Rainer Kunnemeyer, Michael J. Cree, The Univ. of Waikato (New Zealand) . . . [7239-05]

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

### SESSION 2

**Conv. Ctr. Room L: . . . . . .Mon. 10:30 am to 12:00 pm**

**Theory and New Methods for 3D Surface Sensing II**

*Session Chair*: **Derek D. Lichti,** Univ. of Calgary (Canada)

10:30 am: **Characterization of modulated time-of-flight range image sensors** *(Invited Paper)*, Andrew D. Payne, Adrian A. Dorrington, Michael J. Cree, The Univ. of Waikato (New Zealand); Dale A. Carnegie, Victoria Univ. of Wellington (New Zealand) . . . . . [7239-04]

11:00 am: **Three-dimensional shape measurement of aspheric refractive optics by pattern transmission photogrammetry**, Marcus Petz, Marc Fischer, Rainer Tutsch, Technische Univ. Braunschweig (Germany) . . . . . [7239-06]

11:20 am: **A 3D imaging system for inspection of large underwater hydro-electric structures**, François Mirallès, Julien Beaudry, Michel Blain, Hydro Quebec IREQ (Canada); Romano M. De Santis, Ecole Polytechnique de Montréal (Canada); Régis Houde, Hydro Quebec IREQ (Canada); Richard Hurteau, Ecole Polytechnique de Montréal (Canada); Serge Sarraillon, Hydro Quebec IREQ (Canada) . . . . . [7239-07]

11:40 am: **Subtraction stereo: a stereo camera system that focuses on moving regions**, Kazunori Umeda, Yuuki Hashimoto, Tatsuya Nakanishi, Kota Irie, Kenji Terabayashi, Chuo Univ. (Japan). . . . . [7239-33]

Lunch Break . . . . . 12:00 to 1:50 pm

### SESSION 3

**Conv. Ctr. Room L: . . . . . .Mon. 1:50 to 3:10 pm**

**Measurement Standards and Calibration**

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

1:50 pm: **Effect of target penetration on the range measurements of 3D imaging systems**, Geraldine S. Cheok, Kamel S. Saidi, National Institute of Standards and Technology (United States) . . . . . [7239-08]

2:10 pm: **Surface-dependent 3D range camera self-calibration**, Derek D. Lichti, Univ. of Calgary (Canada); Denis Rouzaud, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7239-09]

2:30 pm: **Phase unwrapping and absolute calibration for a low-cost fringe projection system**, Giovanna Sansoni, Marco Trebeschi, Univ. degli Studi di Brescia (Italy) . . . . . [7239-11]

2:50 pm: **Range camera calibration based on image sequences and dense, comprehensive error statistics**, Wilfried Karel, Norbert Pfeifer, Technische Univ. Wien (Austria) . . . . . [7239-12]

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

### SESSION 4

**Conv. Ctr. Room L: . . . . . .Mon. 3:40 to 5:30 pm**

**Coordinate Metrology**

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

3:40 pm: **Dimensional measurement traceability of 3D imaging data** *(Invited Paper)*, Steven D. Phillips, Craig Shakarji, National Institute of Standards and Technology (United States); Kim Summerhays, Metro Sage LLC (United States) . . . . . [7239-13]

4:10 pm: **An industrial comparison of coordinate measuring systems equipped with optical sensors: the VideoAUDIT Project**, Simone Carmignato, Alessandro Voltan, Univ. degli Studi di Padova (Italy). . . . . [7239-15]

4:30 pm: **Traceable optical coordinate metrology applications for the micro range**, Wiebke Ehrig, Michael Neugebauer, Ulrich Neuschaefer-Rube, Physikalisch-Technische Bundesanstalt (Germany) . . . . . [7239-16]

4:50 pm: **Tactile-optical 3D sensor applying image processing**, Ulrich Neuschaefer-Rube, Mark Wissmann, Physikalisch-Technische Bundesanstalt (Germany) . . . . . [7239-17]

5:10 pm: **Experimental study on performance verification tests for coordinate measuring systems with optical distance sensors**, Simone Carmignato, Univ. degli Studi di Padova (Italy). . . . . [7239-18]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

Coffee Break . . . . . 10:00 am

### SESSION 5

**Conv. Ctr. Room L: . . . . . Tues. 10:50 am to 12:00 pm**

**Applications**

*Session Chair*: **Gabriele Guidi,** Politecnico di Milano (Italy)

10:50 am: **Stereo optical tracker for standoff monitoring position and orientation** *(Invited Paper)*, William D. Sherman, Theodore L. Houk, Jonathan M. Saint Clair, Paul F. Sjoholm, Mitchell D. Voth, The Boeing Co. (United States) . . . . . [7239-19]

11:20 am: **Scan image registration in industrial inspection of propeller blades**, David W. Allen, Jacob J. Reiser, James D. Machin, Propulsor Technology Inc. (United States); Craig J. Madden, Naval Surface Warfare Ctr. (United States) . . . . . [7239-20]

11:40 am: **Using 3D range cameras for crime scene documentation and legal medicine**, Giovanna Sansoni, Marco Trebeschi, Univ. degli Studi di Brescia (Italy) . . . . . [7239-21]

Lunch/Exhibition Break . . . . . 12:00 am to 2:00 pm

### SESSION 6

**Conv. Ctr. Room L: . . . . . Tues. 2:00 to 3:00 pm**

**Artifact-based Characterization**

*Session Chair*: **Robert E. Bridges,** FARO Technologies Inc.

2:00 pm: **Characterization of laser scanned point clouds for detecting surface flatness defects**, Pingbo Tang, Burcu Akinci, Daniel F. Huber, Carnegie Mellon Univ. (United States) . . . . . [7239-23]

2:20 pm: **Resolution characteritazion of 3D cameras**, Gabriele Guidi, Michele Russo, Grazia Magrassi, Monica Bordegoni, Politecnico di Milano (Italy)[7239-24]

2:40 pm: **Evaluating laser range scanner lateral resolution in 3D metrology**, David K. MacKinnon, J. Angelo Beraldin, Luc Cournoyer, National Research Council Canada (Canada) . . . . . [7239-25]

### SESSION 7

**Conv. Ctr. Room L: . . . . . Tues. 3:00 to 4:50 pm**

**Measurement Uncertainty**

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

3:00 pm: **Unified computation of strict maximum likelihood for geometric fitting**, Kenichi Kanatani, Okayama Univ. (Japan) . . . . . [7239-26]

3:20 pm: **Ways to verify performance of 3D imaging instruments**, Robert E. Bridges, FARO Technologies Inc. (United States). . . . . [7239-27]

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

4:10 pm: **Proposed procedure for a distance protocol in support of ASTM-E57 standards activities on 3D imaging**, J. Angelo Beraldin, Luc Cournoyer, Francois Blais, Michel Picard, National Research Council Canada (Canada) . . . . . [7239-28]

4:30 pm: **A new 3D anisotropic diffusion filter for speckle reduction algorithm in 3D ultrasound images,** Jinshan Tang, Alcorn State Univ. (United States) . . . . . [7239-30]

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 6:00 pm**

**Interactive Paper and Symposium Demonstration Session**

*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.*

*Authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Three-dimensional reconstruction from multiple reflected views within a realist painting: an application to Scott Fraser's "Three-way vanitas"**, Brandon Smith, Univ. of Wisconsin (United States); David G. Stork, Ricoh Innovations, Inc. (United States) and Stanford Univ. (United States); Li Zhang, Univ. of Wisconsin (United States) . . . . . [7239-31]

**Three-dimensional map construction using a scanning laser range finder**, Yau-Zen Chang, Chang-Gung Univ. (Taiwan); Shih-Tseng Lee, Chang Gung Memorial Hospital (Taiwan) . . . . . [7239-32]

**System for conveyor belt part picking using structured light and 3D pose estimation**, Jens T. Thielemann, Øystein Skotheim, Jens O. Nygaard, SINTEF (Norway); Thor Vollset, Tordivel AS (Norway) . . . . . [7239-35]

**Three-dimensional imaging acquisition, modeling, and prototyping for facial defects reconstruction**, Giovanna Sansoni, Marco Trebeschi, Univ. degli Studi di Brescia (Italy) . . . . . [7239-36]

**Estimating angle-dependent systematic error and measurement uncertainty for a conoscopic holography measurement system**, Anna Paviotti, Simone Carmignato, Alessandro Voltan, Nicola Laurenti, Guido Maria Cortelazzo, Univ. degli Studi di Padova (Italy) . . . . . [7239-14]

## Courses of Related Interest

*Register for courses on-site!*

SC927 3D Imaging (Agam) Wednesday, 8:30 am to 12:30 pm

# Conference 7240

Monday-Thursday 19-22 January 2009 • Proceedings of SPIE Vol. 7240

# Human Vision and Electronic Imaging XIV

*Conference Chairs:* **Bernice E. Rogowitz,** IBM Thomas J. Watson Research Ctr.; **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,** ; **Scott J. Daly,** Sharp Labs. of America, Inc.; **Huib de Ridder,** Technische Univ. Delft (Netherlands); **Gunilla A. M. Derefeldt,** Swedish Defense Research Agency (Sweden); **Elena A. Fedorovskaya,** Eastman Kodak Co.; **Jennifer Gille,** Raytheon Co.; **Sheila S. Hemami,** Cornell Univ.; **Laurent Itti,** Univ. of Southern California; **Stanley A. Klein,** Univ. of California, Berkeley; **Jan J. Koenderink,** Univ. Utrecht (Netherlands); **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); **Hawley K. Rising III,** Consultant; **Sabine E. Süsstrunk,** École Polytechnique Fédérale de Lausanne (Switzerland); **Christopher W. Tyler,** The Smith-Kettlewell Eye Research Institute; **Andrew B. Watson,** NASA Ames Research Ctr.

## Monday 19 January

**Conv. Ctr. Room A3/A6: . . . . . Mon. 9:30 to 11:30 am**

### Keynote Session

*Session Chairs*: **Bernice E. Rogowitz,** IBM Thomas J. Watson Research Ctr.; **Thrasyvoulos N. Pappas,** Northwestern Univ.

9:30 am: **Towards a true spherical camera**, Guru Krishnan, Shree K. Nayar, Columbia Univ. (United States) . . . . . [7240-61]

10:10 am: **Behavioral and neural correlates of visual preference decision**, Shinsuke Shimojo, California Institute of Technology (United States) . . [7240-62]

10:50 am: **Perceptual experiments on the Web**, Ken Nakayama, Harvard Univ. (United States) . . . . . [7240-63]

Lunch Break . . . . . 11:30 am to 1:00 pm

### SESSION 2

**Conv. Ctr. Room A3/A6: . . . . . Mon. 1:00 to 2:30 pm**

### Social Software, Internet Experiments, and New Paradigms for the Web

*Session Chair*: **Jeffrey B. Mulligan,** NASA Ames Research Ctr.

1:00 pm: **Thousands of on-line observers is just the beginning** *(Invited Paper)*, Nathan Moroney, Hewlett-Packard Labs. (United States) . . . . . [7240-64]

1:30 pm: **Presentation of calibrated images over the Web**, Jeffrey B. Mulligan, NASA Ames Research Ctr. (United States) . . . . . [7240-82]

1:50 pm: **Tagging, micro-tagging, and tag editing: using the wisdom of the crowds to improve metadata on shared content**, Mercan Topkara, Bernice E. Rogowitz, IBM Thomas J. Watson Research Ctr. (United States) . . . . . [7240-65]

2:10 pm: **Internet experiments: methods, guidelines, metadata**, Ulf-Dietrich Reips, Univ. Zürich (Switzerland). . . . . [7240-88]

### SESSION 3

**Conv. Ctr. Room A3/A6: . . . . . Mon. 2:30 to 5:50 pm**

### Multimodal Interactive Environments

*Session Chair*: **Huib de Ridder,** Technische Univ. Delft (Netherlands)

2:30 pm: **Ecological optics of natural materials and light fields** *(Invited Paper)*, Sylvia Pont, Technische Univ. Delft (Netherlands) . . . . . [7240-66]

3:00 pm: **Stereoscopic displays in medical domains: a review of perception and performance effects**, Maurice van Beurden, Wijnand A. Ijsselsteijn, Technische Univ. Eindhoven (Netherlands); Gert van Hoey, Barco N.V. (Belgium); Harry Hatzakis, Biotronics3D (United Kingdom) . . . . . [7240-84]

3:20 pm: **Roughness in sound and vision**, Rene van Egmond, Paul Lemmens, Technische Univ. Delft (Netherlands); Thrasyvoulos N. Pappas, Northwestern Univ. (United States); Huib de Ridder, Technische Univ. Delft (Netherlands) . . . . . [7240-67]

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

4:10 pm: **Sign language perception research for improving automatic sign and gesture recognition**, Gineke A. ten Holt, Huib de Ridder, Andrea J. Koenderink-van Doorn, Marcel J. T. Reinders, Emile A. Hendriks, Technische Univ. Delft (Netherlands) . . . . . [7240-33]

4:30 pm: **Quantifying the effect of disruptions to temporal coherence on the intelligibility of compressed American Sign Language video**, Frank M. Ciaramello, Sheila S. Hemami, Cornell Univ. (United States) . . . . . [7240-32]

4:50 pm: **"I'm always touched by your presence, dear": investigating the role of input in mediated social touch**, Antal Haans, Wijnand A. Ijsselsteijn, Technische Univ. Eindhoven (Netherlands). . . . . [7240-68]

5:10 pm: **Virtual microscopy: merging of computer mediated communication and intuitive interfacing**, Huib de Ridder, Technische Univ. Delft (Netherlands); Johanna G. de Ridder-Sluiter, Dutch Child Oncology Group (Netherlands); Philip H. Kluin, Univ. Medical Ctr. Groningen (Netherlands); Henri H.C.M. Christiaans, Technische Univ. Delft (Netherlands) . . . . . [7240-69]

5:30 pm: **A model of memory for incidental learning,** Roger A. Browse, Lisa Y. Drewell, Queen's Univ. (Canada). . . . . [7240-50]

**Mon. 7:30 to 10:00 pm**

**Human Vision and Electronic Imaging Banquet**

*Banquet Speaker:* **Martin S. Banks,** Univ. of California, Berkeley

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 4

**Conv. Ctr. Room A3/A6: . . . . . Tues. 10:30 am to 12:40 pm**

### Haptics

*Session Chairs*: **Bernice E. Rogowitz,** IBM Thomas J. Watson Research Ctr.; **Thrasyvoulos N. Pappas,** Northwestern Univ.

10:30 am: **The interaction of vision and haptics during the perception of 3D shape** *(Invited Paper)*, Flip Phillips, Eric Egan, Skidmore College (United States) . . . . . [7240-70]

11:00 am: **Haptics cuing** *(Invited Paper)*, Hong Z. Tan, Purdue Univ. (United States) . . . . . [7240-71]

11:30 am: **Psychophysical evaluation of a variable friction tactile interface** *(Invited Paper)*, Evren Samur, J. Edward Colgate, Michael A. Peshkin, Northwestern Univ. (United States) . . . . . [7240-73]

12:00 pm: **Perceptual dimensions for a dynamic tactile display**, Vivien Tartter, City College/CUNY (United States); Thrasyvoulos N. Pappas, Northwestern Univ. (United States) . . . . . [7240-74]

12:20 pm: **Haptics disambiguates vision in the perception of pictorial relief**, Maarten W. A. Wijntjes, Technische Univ. Delft (Netherlands); Robert Volcic, Westfaelische Wilhelms-Univ. (Germany); Jan J. Koenderink, Sylvia C. Pont, Technische Univ. Delft (Netherlands); Astrid M. L. Kappers, Univ. Utrecht (Netherlands) . . . . . [7240-75]

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

## SESSION 5

**Conv. Ctr. Room A3/A6: . . . . . Tues. 2:00 to 5:30 pm**

### High Dynamic Range

*Session Chair*: **John J. McCann,** McCann Imaging

2:00 pm: **Dynamic range of visual activities of space**, Albert J. Ahumada, Jr., Mary K. Kaiser, Jeffrey B. Mulligan, NASA Ames Research Ctr. (United States) . . . . . [7240-76]

2:20 pm: **Adaptive display of high-dynamic range images**, Corey Manders, Farzam Farbiz, A*STAR Institute for Infocomm Research (Singapore) . . [7240-11]

2:40 pm: **Exploring eye movements for tone mapped images.**, Marina Bloj, Glen Harding, Univ. of Bradford (United Kingdom); Alan Chalmers, Univ. of Warwick (United Kingdom) . . . . . [7240-42]

3:00 pm: **SS-SSIM and MS-SSIM for digital cinema applications**, Fitri N. Rahayu, Ulrich Reiter, Norwegian Univ. of Science and Technology (Norway); Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Andrew Perkis, Peter Svensson, Norwegian Univ. of Science and Technology (Norway) . . . . . [7240-13]

3:20 pm: **Measuring Perceptual Contrast in a Multi-level Framework**, Gabriele Simone, Marius Pedersen, Jon Yngve Hardeberg, Gjøvik Univ. College (Norway); Alessandro Rizzi, Univ. degli Studi di Milano (Italy). . . . . [7240-05]

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

4:10 pm: **A perceptual evaluation of 3D unsharp masking**, Matthias B. Ihrke, Max-Planck-Institut für Dynamik und Selbstorganisation (Germany) and Bernstein Ctr. for Computational Neuroscience (Germany); Tobias Ritschel, Kaleigh Smith, Thorsten Grosch, Karol Myszkowski, Hans-Peter Seidel, Max-Planck-Institut für Informatik (Germany) . . . . . [7240-34]

4:30 pm: **Objective evaluation of tone mapping operator parameters**, Tunc O. Aydin, Karol Myszkowski, Hans-Peter Seidel, Max-Planck-Institut für Informatik (Germany) . . . . . [7240-41]

4:50 pm: **Influence of surround luminance upon perceived blackness**, Tetsuya Eda, Yoshiki Koike, Sakurako Matsushima, Koichi Ozaki, Miyoshi Ayama, Utsunomiya Univ. (Japan) . . . . . [7240-06]

5:10 pm: Preservation of edges: the mechanism for improvements in HDR imaging, John J. McCann, McCann Imaging (United States); Alessandro Rizzi, Univ. degli Studi di Milano (Italy) . . . . . [7240-39]

**Conv. Ctr. Room A3/A6: . . . . . Tues. 6:00 to 7:00 pm**

**Panel Discussion**

**When are HDR Images better than Conventional Images?**

*Panel Moderator:* **John J. McCann,** McCann Imaging

*Panel Members:* **Albert J. Ahumada, Jr.,** NASA Ames Research Ctr.; **Marina Bloj,** Univ. of Bradford (United Kingdom); **James O. Larimer,** NASA Ames Research Ctr.; **Karol Myszkowski,** Max-Planck-Institut für Informatik (Germany); **Alessandro Rizzi,** Univ. degli Studi di Milano (Italy); **Sabine E. Süsstrunk,** Ecole Polytechnique Fédérale de Lausanne (Switzerland)

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Model validation of channel zapping quality**, Robert E. Kooij, TNO TPD (Netherlands) and University of Technology Delft (Netherlands); Floris Nicolai, University of Technology Delft (Netherlands); Kanal Ahmed, TNO TPD (Netherlands); Kjell E. Brunnström, Acreo AB (Sweden) . . . . . [7240-31]

**Application of a visual model to the design of an ultra-high definition upscaler**, Jon M. Speigle, Dean S. Messing, Scott J. Daly, Sharp Labs. of America, Inc. (United States) . . . . . [7240-54]

**Hyperbolic modeling for metaphorical processing and visual computations**, Hawley K. Rising III, Sony Electronics Inc. (United States) . . . . . [7240-79]

**Visual harmony and image statistics: an empirical investigation**, Elena A. Fedorovskaya, Wei Hao, Carman Neustaedter, Eastman Kodak Co. (United States) . . . . . [7240-59]

**Sketch recognition robust to the sketch order**, Junyeong Yang, Yonsei Univ. (South Korea). . . . . [7240-12]

**Facilitation of listening comprehension by visual information under noisy listening condition**, Chiho Kashimada, Kazuki Ogita, Hiroshi Hasegawa, Kazuo Kamata, Miyoshi Ayama, Utsunomiya Univ. (Japan). . . . . [7240-09]

# Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

## SESSION 6

**Conv. Ctr. Room A3/A6: . . . . . .Wed. 9:30 am to 12:00 pm**

### Video Perception and Quality

*Session Chair*: **Sheila S. Hemami,** Cornell Univ.

9:30 am: **HVS-based quantization steps for validation of digital cinema extended bitrates**, Chaker M. Larabi, Univ. de Poitiers (France); Pascal Pellegrin, Univ. Catholique de Louvain (Belgium); Olivier Tulet, Univ. de Poitiers (France); Pedro Correa, Univ. Catholique de Louvain (Belgium); Ghislain Anciaux, Univ. de Poitiers (France); Parvatha Elangovan, Benoît Macq, Univ. Catholique de Louvain (Belgium) . . . . . [7240-27]

9:50 am: **Statistics of natural image sequences: temporal motion smoothness by local phase correlations**, Zhou Wang, Univ. of Waterloo (Canada); Qiang Li, The Univ. of Texas at Arlington (United States). . . . [7240-37]

10:10 am: **Motion-based perceptual quality assessment of video**, Kalpana Seshadrinathan, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . [7240-56]

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

11:00 am: **No reference perceptual quality metrics: approaches and limitations**, David S. Hands, Damien Bayart, Andrew Davis, Alex Bourret, British Telecommunications plc (United Kingdom) . . . . . [7240-02]

11:20 am: **Subjective video quality assessment methods for recognition tasks**, Carolyn G. Ford, Mark McFarland, Irena Stange, Institute of Telecommunication Sciences (United States). . . . . [7240-01]

11:40 am: **Image utility assessment and a relationship with image quality assessment**, David M. Rouse, Cornell Univ. (United States); Romuald Pepion, Univ. de Nantes (France); Sheila S. Hemami, Cornell Univ. (United States); Patrick Le Callet, Univ. de Nantes (France). . . . . [7240-49]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

## SESSION 7

**Conv. Ctr. Room A3/A6: . . . . . Wed. 1:30 to 3:10 pm**

### Region of Interest, Sharpness and Blurring

*Session Chair*: **Scott J. Daly,** Sharp Labs. of America, Inc.

1:30 pm: **Optimal region-of-interest-based visual quality assessment**, Ulrich Engelke, Hans-Jürgen Zepernick, Blekinge Tekniska Högskola (Sweden) . . . . . [7240-17]

1:50 pm: **Perceptually significant spatial pooling techniques for image quality assessment**, Anush K. Moorthy, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . [7240-36]

2:10 pm: **A methodology for coupling a visual enhancement device to human visual attention**, John A. Black, Jr., Aleksandar Todorovic, Sethuraman Panchanathan, Arizona State Univ. (United States) . . . . . [7240-57]

2:30 pm: **Analysis of sharpness increase by image noise**, Takehito Kurihara, Naokazu Aoki, Hiroyuki Kobayashi, Chiba Univ. (Japan) . . . . . [7240-21]

2:50 pm: **Psychophysical study of LCD motion blur perception**, Sylvain Tourancheau, Patrick Le Callet, University of Nantes (France); Kjell Brunnström, Borje Andrén, Acreo AB (Sweden) . . . . . [7240-51]

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

## SESSION 8

**Conv. Ctr. Room A3/A6: . . . . . Wed. 3:40 to 6:00 pm**

### Image Analysis and Perception

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

3:40 pm: **Pattern masking investigations of the 2nd order visual mechanisms**, Pi-Chun Huang, Chien-Chung Chen, National Taiwan Univ. (Taiwan). . . . . [7240-14]

4:00 pm: **Parsed and fixed block representations of visual information for image retrieval**, Soo Hyun Bae, Biing-Hwang Juang, Georgia Institute of Technology (United States). . . . . [7240-47]

4:20 pm: **Efficient construction of saliency map**, Wen-Fu Li, Tai-Hsiang Huang, Yi-Hsin Huang, Mei-Lan Chu, Homer H. Chen, National Taiwan Univ. (Taiwan) . . . . . [7240-45]

4:40 pm: **Unsupervised image segmentation by adaptive gradient thresholding for dynamic region growth in the CIE L*a*b* color space**, Sreenath Rao Vantaram, Eli Saber, Vincent Amuso, Rochester Institute of Technology (United States); Mark Q. Shaw, Ranjit Bhaskar, Hewlett-Packard Co. (United States). . . . . [7240-03]

5:00 pm: **Harmonic analysis for cognitive vision: perisaccadic vision**, Jacek Turski, Univ. of Houston (United States). . . . . [7240-19]

5:20 pm: **Preferred grayscale images for human observers**, Mark S. Drew, Simon Fraser Univ. (Canada); David Connah, Graham D. Finlayson, Univ. of East Anglia Norwich (United Kingdom); Marina Bloj, Univ. of Bradford (United Kingdom). . . . . [7240-40]

5:40 pm: Preserving visual saliency in image to sound substitution systems, Codruta O. Ancuti, Cosmin Ancuti, Philippe Bekaert, Univ. Hasselt (Belgium) . . . . . [7240-48]

**Conv. Ctr. Room A3/A6: . . . . . Wed. 6:00 to 7:00 pm**

**Discussion Session: Image Analysis and Quality**

*Joint Discussion Session with Conference 7242, Image Quality and System Performance*

# Thursday 22 January

## SESSION 9

**Conv. Ctr. Room A3/A6: . . . . . Thurs. 9:20 am to 12:00 pm**

### 3D Perception, Environments, and Applications

*Session Chair*: **Bernice E. Rogowitz,** IBM Thomas J. Watson Research Ctr.

9:20 am: **Model based evaluation of human perception of stereoscopically visualized semi-transparent surfaces** *(Invited Paper)*, Michael Kleiber, Carsten Winkelholz, Verena Kinder, Research Establishment for Applied Science (Germany) . . . . . [7240-28]

9:50 am: **Influence of chroma variations on naturalness and image quality in stereoscopic images**, André Kuijsters, Marc Lambooij, Wijnand A. Ijsselsteijn, Technische Univ. Eindhoven (Netherlands); Ingrid E. J. Heynderickx, Philips Research (Netherlands). . . . . [7240-85]

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

10:40 am: **Color rendering indices in global illumination methods**, David Geisler-Moroder, Arne Dür, Univ. Innsbruck (Austria). . . . . [7240-08]

11:00 am: **Luminance, disparity, and range statistics in 3D natural scenes**, Yang Liu, Alan C. Bovik, Lawrence K. Cormack, The Univ. of Texas at Austin (United States). . . . . [7240-46]

11:20 am: **Three-dimensional visualization of geographical terrain data using temporal parallax difference induction**, Christopher A. Mayhew, Craig M. Mayhew, Vision III Imaging, Inc. (United States). . . . . [7240-26]

11:40 am: **Measuring hand, head, and vehicle motions in commuting environments**, Feng Li, Jeff B. Pelz, Rochester Institute of Technology (United States); Scott J. Daly, Sharp Labs. of America, Inc. (United States) . . . [7240-22]

Lunch Break . . . . . 12:00 to 1:30 pm

## SESSION 10

**Conv. Ctr. Room A3/A6: . . . . . .Thurs. 1:30 to 4:40 pm**

### Art and Perception

*Session Chairs*: **Elena Federovskaya,** .; **Hawley K. Rising III,** Sony Electronics Inc.; **David G. Stork,** Ricoh Innovations, Inc.; **Michael H. Brill,** Datacolor

1:30 pm: **Photography and the matter of sculpture**, Leigh R. Markopoulos, California College of the Arts (United States) . . . . . [7240-87]

1:50 pm: **Aesthetic signs: understanding human preferences for spatial composition**, Stephen Palmer, Univ. of California, Berkeley (United States) . . . . . [7240-80]

2:10 pm: **Visually representing reality: aesthetics and accessibility aspects**, Floris L. van Nes, Technische Univ. Eindhoven (Netherlands) . . . . . [7240-15]

2:30 pm: **Estimating the position of illuminants in paintings under weak model assumptions: an application to the works of two Baroque masters**, David Kale, Stanford Univ. (United States); David G. Stork, Ricoh Innovations, Inc. (United States) and Stanford Univ. (United States) . . . . . [7240-23]

2:50 pm: **Intensity statistics of artwork: connections to human visual perception**, Daniel J. Graham, Dartmouth College (United States); Jay Friedenberg, Manhattan College (United States); Daniel N. Rockmore, Dartmouth College (United States); David J. Field, Cornell Univ. (United States). . . [7240-77]

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

3:40 pm: **Painted or printed? Correlation analysis of the brickwork in Jan van der Heyden's View of Oudezijds Voorburgwal with the Oude Kerke in Amsterdam**, David G. Stork, Ricoh Innovations, Inc. (United States); Sean Meador, Stanford Univ. (United States) . . . . . [7240-78]

4:00 pm: **Quantifying artist's use of human vision constructs to influence viewer eye gaze**, Steve DiPaola, Simon Fraser Univ. (Canada). . . . . [7240-20]

4:20 pm: **Chiasmus,** Stephen Cady, The Univ. of Advancing Technology (United States) . . . . . [7240-53]

**Conv. Ctr. Room A3/A6: . . . . . Thurs. 4:50 pm**

### Panel Discussion on Art and Perception

*Panel Members*: **Stephen Palmer,** Univ. of California, Berkeley; **David G. Stork,** Ricoh Innovations, Inc.; **Steve DiPaola,** Simon Fraser Univ. (Canada); **Stephen Cady,** The Univ. of Advancing Technology

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC762 Device Simulation for Image Quality Evaluation (Farrell, Catrysse) Thursday, 8:30 am to 12:30 pm |
| SC812 Perceptual Metrics for Image Quality Evaluation (Pappas, Hemami) Sunday, 1:30 to 5:30 pm |
| SC899 Visual Ergonomics and Aesthetics in Electronic Imaging (van Nes) Sunday, 8:30 am to 12:30 pm |
| SC871 Noise, Image Processing, and their Influence on Resolution (Matherson, Wueller) Sunday, 1:30 to 5:30 pm |

# Conference 7241

Tuesday-Thursday 20-22 January 2009 • Proceedings of SPIE Vol. 7241

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

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

*Program Committee:* **Jan P. Allebach,** Purdue Univ.; **Scott J. Daly,** Sharp Labs. of America, Inc.; **Phil J. Green,** London College of Communication (United Kingdom); **Roger-David Hersch,** École Polytechnique Fédérale de Lausanne (Switzerland); **Choon-Woo Kim,** Inha Univ. (South Korea); **Michael A. Kriss,** Consultant; **Fritz Lebowsky,** STMicroelectronics (France); **Nathan Moroney,** Hewlett-Packard Co.; **Chris Tuijn,** Agfa-Gevaert Group (Belgium)

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 1

**Conv. Ctr. Room A2: . . . . . .Tues. 10:30 to 11:30 am**

**Color Studies**

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

10:30 am: **A study on the equivalence of controlled and uncontrolled visual experiments**, Silvia Zuffi, Carla Brambilla, Consiglio Nazionale delle Ricerche (Italy); Reiner Eschbach, Xerox Corp. (United States); Alessandro Rizzi, Univ. degli Studi di Milano (Italy) . . . . . [7241-01]

10:50 am: **The influence of surround luminance on the perceived image quality**, Kai Man R. Ho, Industrial Technology Research Institute (Taiwan) . . . . . [7241-02]

11:10 am: **Development of practical investigation system for cultural properties based on a projector-camera system**, Kimiyoshi Miyata, National Museum of Japanese History (Japan) . . . . . [7241-03]

### SESSION 2

**Conv. Ctr. Room A2: . . . . . Tues. 11:30 am to 12:30 pm**

**Retinex-based Methods**

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

11:30 am: **Enhancement of integrated multiscale Retinex based on CIELAB color space**, Wang-Jun Kyung, Tae-Hyoung Lee, Kyungpook National Univ. (South Korea); Cheol-Hee Lee, Andong National Univ. (South Korea); Yeong-Ho Ha, Kyungpook National Univ. (South Korea) . . . . . [7241-04]

11:50 am: **Fast Implementation of color constancy algorithms**, Jean-Michel Morel, Ecole Normale Supérieure de Cachan (France); Ana B. Petro, Univ. de les Illes Balears (Spain) and Ecole Normale Supérieure de Cachan (France); Catalina Sbert, Univ. de les Illes Balears (Spain) . . . . . [7241-05]

12:10 pm: **Implementation of Retinex algorithm by eyegaze tracking interface**, Ryo Ohtera, Takahiko Horiuchi, Shoji Tominaga, Chiba Univ. (Japan) . . . . . [7241-06]

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

### SESSION 3

**Conv. Ctr. Room A2: . . . . . Tues. 2:00 to 3:40 pm**

**Displays I**

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

2:00 pm: **A multiprimary display model combined with a spatio-temporal behavioral display model for display characterization by simulation**, Carsten Dolar, Univ. Dortmund (Germany); Fritz Lebowsky, STMicroelectronics (France) . . . . . [7241-07]

2:20 pm: **A subjective evaluation of high-chroma color with wide color gamut display**, Junko Kishimoto, Masahiro Yamaguchi, Nagaaki Ohyama, Tokyo Institute of Technology (Japan) . . . . . [7241-08]

2:40 pm: **Preferred color correction for digital LCD TVs**, Kyoung Tae Kim, Choon-Woo Kim, Inha Univ. (South Korea); Ji-Young Ahn, Dong-Woo Kang, Hyun-Ho Shin, LG Display (Korea, Republic of) . . . . . [7241-09]

3:00 pm: **Optimizing color quality for LED backlight modulated LCD TVs**, Fritz Lebowsky, STMicroelectronics (France) . . . . . [7241-10]

3:20 pm: **Sub-pixel-based MVA LCTV characterization and color modeling**, Jiaying Wu, Rochester Institute of Technology (United States) and Sharp Labs. of America, Inc. (United States); Xiao-fan Feng, Scott J. Daly, Sharp Labs. of America, Inc. (United States) . . . . . [7241-11]

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

### SESSION 4

**Conv. Ctr. Room A2: . . . . . Tues. 4:10 to 6:10 pm**

**Displays II**

*Session Chair*: **Choon-Woo Kim,** Inha Univ. (Korea, Republic of)

4:10 pm: **Suppressing color breakup with eye tracking**, Wei-Chung Cheng, Chih-Nan Wu, National Chiao Tung Univ. (Taiwan); Wen-Chih Tai, Chih-Chun Chang, Chunghwa Picture Tubes, Ltd. (Taiwan) . . . . . [7241-12]

4:30 pm: **Evaluation of gray level reproduction in dark areas on plasma display panel**, Yu Hoon Kim, Choon-Woo Kim, Inha Univ. (South Korea) . . . . . [7241-13]

4:50 pm: **Compensating for non-uniform screens in projection display systems**, Siavash A. Renani, Gjøvik Univ. College (Norway); Masato Tsukada, NEC Corp. (Japan); Jon Yngve Hardeberg, Gjøvik Univ. College (Norway) and The Norwegian Color Research Lab. (Norway) . . . . . [7241-14]

5:10 pm: **A color compensation method for a projector considering non-flatness**, Soo-Jin Sung, Yeong-Ho Ha, Kyungpook National Univ. (Korea, Republic of) . . . . . [7241-15]

5:30 pm: **Extraction of memory colors for preferred color correction in digital TVs**, Jee Young Yum, Byong Tae Ryu, Choon-Woo Kim, Inha Univ. (South Korea); Ji-Young Ahn, Dong-Woo Kang, Hyun-Ho Shin, LG Display (Korea, Republic of) . . . . . [7241-16]

5:50 pm: **Color naturalness modeling for a mobile display,** Jang Jin Yoo, Ming R. Luo, Guihua Cui, Univ. of Leeds (United Kingdom) . . . . . [7241-17]

**San Jose Convention Center,**
**Exhibit Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

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**Four-flux Kubelka-Munk model of the light reflectance for printing of rough substrate**, Na Dong, Jiangnan Univ. (China) . . . . . [7241-54]

**Optimal ink selection based on independent component analysis and vector distance measure**, Faqiang Xu, Xiaoxia Wan, Wuhan Univ. (China) . . . [7241-56]

**Six-color separation based on Yule-Nielsen modified spectral Neugebauer model and genetic algorithm**, Faqiang Xu, Xiaoxia Wan, Wuhan Univ. (China) . . . . . [7241-57]

**The Murray-Davies reflectance model of haltone fluorescent ink prints**, Yuanyuan Ning, Yixin Zhang, Jiangnan Univ. (China) . . . . . [7241-58]

**The color prediction model of fluorescent prints**, Na Dong, Yixin Zhang, Jiangnan Univ. (China). . . . . [7241-59]

**Color prediction for print based on kubelka-munk theory and under ink penetration**, Guoyun Shi, Jiangnan Univ. (China) . . . . . [7241-60]

**Colorization of grayscale images and videos using a semi-automatic approach**, Vivek G. Jacob, Sumana Gupta, Indian Institute of Technology Kanpur (India) . . . . . [7241-61]

## Wednesday 21 January

### Plenary Presentation

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 5

**Conv. Ctr. Room A2: . . . . . Wed. 9:30 to 10:30 am**

### Vision

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

9:30 am: **Color universal design**, Yasuyo G. Ichihara, Kogakuin Univ. (Japan) . . . . . [7241-18]

9:50 am: **Application of categorical colors to area segmentation for road image**, Tomoaki Ashiguchi, Takaya Yaguchi, Kazuya Kijima, Utsunomiya Univ. (Japan); Shinnosuke Ishida, Yuichi Nakanishi, Honda R&D Co., Ltd. (Japan); Kenji Shoji, Miyoshi Ayama, Utsunomiya Univ. (Japan). . . . . [7241-19]

10:10 am: **The relationship between ambient illumination and psychological factor in viewing of display images**, Takuya Iwanami, Sharp Corp. (Japan); Ayano Kikuchi, Chiba Univ. (Japan); Takashi Kaneko, Sharp Corp. (Japan); Keita Hirai, Natsumi Yano, Toshiya Nakaguchi, Norimichi Tsumura, Chiba Univ. (Japan); Yasuhiro Yoshida, Sharp Corp. (Japan); Yoichi Miyake, Chiba Univ. (Japan). . . . . [7241-20]

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

### SESSION 6

**Conv. Ctr. Room A2: . . . . . Wed. 11:00 am to 12:40 pm**

### High Dynamic Range Imaging

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

11:00 am: **A high-dynamic range and high-resolution projector with double modulation**, Yuichi Kusakabe, Masaru Kanazawa, Yuji Nojiri, NHK Science & Technical Research Labs. (Japan); Masato Furuya, Makoto Yoshimura, Victor Co. of Japan, Ltd. (Japan) . . . . . [7241-25]

11:20 am: **Color appearance and color rendering of HDR scenes: an experiment**, Carinna E. Parraman, Univ. of the West of England (United Kingdom); Alessandro Rizzi, Univ. degli Studi di Milano (Italy); John J. McCann, McCann Imaging (United States) . . . . . [7241-26]

11:40 am: **High dynamic range LCD using extended Stencil-FSC method**, Pei-Li Sun, Shih Hsin Univ. (Taiwan) . . . . . [7241-62]

12:00 pm: **Locally adaptive HDR image reproduction inspired by human visual system**, Kang Eui Lee, Wonhee Choe, Jae-Hyun Kwon, Seong-Deok Lee, Chang-Yeong Kim, Samsung Advanced Institute of Technology (South Korea) . . . . . [7241-28]

12:20 pm: **Spectral printer modeling for transparency media: toward high dynamic range scene reproduction**, Jon S. McElvain, Jonathan Miller, Digital Imaging Systems (United States); Elaine Jin, Aptina Imaging (United States) . . . . . [7241-29]

Lunch/Exhibition Break . . . . . 12:40 to 1:30 pm

### SESSION 7

**Conv. Ctr. Room A2: . . . . . Wed. 1:30 to 3:10 pm**

### Spectral Imaging

1:30 pm: **Color-crosstalk estimation using spectral image processing for CMOS cameras**, Reza Safaee-Rad, Milivoje Aleksic, Advanced Micro Devices, Inc. (Canada) . . . . . [7241-30]

1:50 pm: **Spectral reflectance estimation using a six-color scanner**, Shoji Tominaga, Satoshi Kohno, Hirokazu Kakinuma, Fuminori Nohara, Takahiko Horiuchi, Chiba Univ. (Japan) . . . . . [7241-31]

2:10 pm: **On determining the color gamut of N-ink printers**, Yu Wang, Carinna E. Parraman, Univ. of the West of England (United Kingdom) . . . . . [7241-32]

2:30 pm: **Data-driven spectral model for color gamut simulation**, Pau Soler, Jan Morovic, Hewlett-Packard Co. (Spain); Howard Doumaux, Hewlett-Packard Co. (United States) . . . . . [7241-27]

2:50 pm: **Multispectral imaging with optical bandpass filters: tilt angle and position estimation**, Johannes Brauers, Til Aach, RWTH Aachen (Germany) . . . . . [7241-42]

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

### SESSION 8

**Room: . . . . . Wed. 3:40 to 5:00 pm**

### Image Enhancement

*Session Chair*: **Chris Tujin,** Agfa Gevaert N.V. (Belgium)

8:30 am: **Color image processing for mobile devices**, Rodney Shaw, White Rose Digital (United States). . . . . [7241-35]

8:50 am: **Color compensation of histogram equalized images**, Hee-Won Lee, Sejung Yang, Byung-Uk Lee, Ewha Womans Univ. (South Korea). . . . . [7241-36]

9:10 am: **Bilateral filtering and adaptive tone-mapping for qualified edge and image enhancement**, Kuo-Jui Hu, Ting-Ting Chang, Min-Yao Lu, Wu-Jeng Li, Jih-Fon Huang, Industrial Technology Research Institute (Taiwan) . . . . [7241-38]

9:30 am: **HSV-based contrast stretching for color image enhancement**, Mi-Hye Kim, Kyungpook National Univ. (South Korea); Ick-Hoon Jang, Kyungwoon Univ. (South Korea); Nam-Chul Kim, Kyungpook National Univ. (South Korea) . . . . . [7241-39]

## Thursday 22 January

### SESSION 9

**Conv. Ctr. Room A2: . . . . . .Thurs. 8:20 to 10:00 am**

#### Image Processing

8:20 am: **Hardware-friendly mixed content compression algorithm**, Maribel Figuera, Purdue Univ. (United States); Peter Majewicz, Hewlett-Packard Co. (United States); Charles A. Bouman, Purdue Univ. (United States) . . . . [7241-40]

8:40 am: **Sub-pixel estimation using iterative phase correlation**, Ho-Gun Ha, In-Su Jang, Kyung-Woo Ko, Yeong-Ho Ha, Kyungpook National Univ. (South Korea) . . . . . [7241-41]

9:00 am: **Predicting the performance of a spatial gamut mapping algorithm**, Arne M. Bakke, Ivar Farup, Jon Y. Hardeberg, Gjøvik Univ. College (Norway) . . . . . [7241-34]

9:20 am: **A method to improve the invertibility of ICC profiles that use lookup tables**, HuanZhao Zeng, Ingeborg Tastl, Kok-Wei Koh, Jack M. Holm, Hewlett-Packard Co. (United States) . . . . . [7241-43]

9:40 am: **An RGB color management concept based on an improved gamut mapping algorithm**, Ursina Caluori, Klaus Simon, EMPA (Switzerland) [7241-44]

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

### SESSION 10

**Conv. Ctr. Room A2: . . . . . Thurs. 10:30 am to 12:10 pm**

#### Printing I

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

10:30 pm: **Compensation of printer MTFs**, Nicolas Bonnier, Albrecht Lindner, Christophe Leynadier, Océ Print Logic Technologies (France); Francis Schmitt, Ecole Nationale Supérieure des Télécommunications (France) . . . . . [7241-45]

10:50 pm: **Dot-gain estimation using a linear model incorporating neighboring and clustering effects**, Tobias Stamm, Klaus Simon, EMPA (Switzerland) . . . . . [7241-46]

11:10 pm: **Calibrating the ink spreading enhanced Yule-Nielsen modified spectral Neugebauer model with two by two dot centered patterns**, Romain Rossier, Roger Hersch, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7241-47]

11:30 pm: **Recent trends in print portals and web2print applications**, Chris Tuijn, Agfa-Gevaert Group (Belgium) . . . . . [7241-48]

11:50 pm: **Houston, we have a color issue!**, Hector J. Santos-Villalobos, Purdue Univ. (United States); Victor Loewen, Hewlett-Packard Co. (United States); Jan P. Allebach, Purdue Univ. (United States) . . . . . [7241-49]

Lunch Break . . . . . 12:10 to 1:40 pm

### SESSION 11

**Conv. Ctr. Room A2: . . . . . .Thurs. 1:40 to 3:00 pm**

#### Printing II

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

1:40 pm: **Creating variable data InfraRed encodings for security applications**, Reiner Eschbach, Raja Bala, Martin S. Maltz, Yonghui Zhao, Xerox Corp. (United States) . . . . . [7241-50]

2:00 pm: **Content-based gamut mapping algorithm for multiple engine printing**, Wencheng Wu, Zhigang Z. Fan, Edul N. Dalal, Xerox Corp. (United States) . . . . . [7241-51]

2:20 pm: **Printability beyond the limits: an alternative double-printing method for inkjet**, Carinna E. Parraman, Yu Wang, Univ. of the West of England (United Kingdom) . . . . . [7241-52]

2:40 pm: **Cluster-based binary printer model**, Shen-Ge Wang, Xerox Corp. (United States) . . . . . [7241-53]

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

### SESSION 12

**Conv. Ctr. Room A2: . . . . . .Wed. 3:30 to 5:15 pm**

#### Dark Side of Color

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

3:30 pm: **Well asked questions** *(Invited Paper)*, Reiner Eschbach, Xerox Corp. (United States) . . . . . [7241-21]

3:45 pm: **Pictoral information as transcribed by the artist or designer,** Stephen Hoskins, Univ. of West England (United Kingdom) . . . . . [7241-71]

4:00 pm: **Consider the size: and other display features,** G.M. Johnson, Apple, Inc. (United States) . . . . . [7241-72}

4:15 pm: **"Adaptation! ...What Adaptation?"** *(Invited Paper)*, John J. McCann, McCann Imaging (United States) . . . . . [7241-23]

4:30 pm: **The opposite of green is purple?** *(Invited Paper)*, Nathan Moroney, Hewlett-Packard Labs. (United States) . . . . . [7241-22]

4:45 pm: **Now...which color was that again?** *(Invited Paper)*, Sabine E. Süsstrunk, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . [7241-24]

5:00 pm: **Stepford: the city for colour engineering,** Stephen Westland, Univ. of Derby (United Kingdom) . . . . . [7241-73

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC060 Stereoscopic Display Application Issues (Merritt, Woods) Sunday, 8:30 am to 5:30 pm |
| SC516 Color for Liquid Crystal Displays (Marcu) Monday, 1:30 to 5:30 pm |
| SC870 Color Processing and its Characterisation for Digital Photography (Matherson, Wueller) Sunday, 8:30 am to 12:30 pm |
| SC930 Optimizing Color Reproduction Systems (Marcu) Monday, 8:30 am to 12:30 pm |

# Conference 7242

Monday-Wednesday 19-21 January 2009 • Proceedings of SPIE Vol. 7242

# Image Quality and System Performance VI

*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; **Jason E. Gibson,** Hewlett-Packard Co.; **Dirk W. Hertel,** Sensata Technologies, Inc.; **Robin Jenkin,** Aptina Imaging; **Sang Ho Kim,** Samsung Electronics Co. (South Korea); **Yoichi Miyake,** Chiba Univ. (Japan); **Göte S. Nyman,** Univ. of Helsinki (Finland); **D. René Rasmussen,** Xerox Corp.; **Sophie Triantaphillidou,** Univ. of Westminster (United Kingdom); **Lindsay William MacDonald,** London College of Communication (United Kingdom); **Eric K. Zeise,** Eastman Kodak Co.

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room B3: . . . . . .Mon. 9:00 to 10:30 am**

#### Image Quality Standards for Print

*Session Chair*: **Susan P. Farnand,** Rochester Institute of Technology

9:00 am: **Characteristic measurements for the qualification of reflection scanners in the evaluation of image quality attributes.** *(Invited Paper)*, Eric K. Zeise, Eastman Kodak Co. (United States) . . . . . [7242-01]

9:30 am: **INCITS W1.1 development update: Appearance-based image quality standards for printers.**, Eric K. Zeise, Eastman Kodak Co. (United States); Edul Dalal, Xerox Corp. (United States); Ann McCarthy, Lexmark International, Inc. (United States); Yee S. Ng, Eastman Kodak Co. (United States); Rene Rasmussen, Xerox Corp. (United States) . . . . . [7242-02]

9:50 am: **INCITS W1.1 macro uniformity**, D. René Rasmussen, Xerox Corp. (United States); Kevin D. Donohue, Univ. of Kentucky (United States); Frans Gaykema, Océ Technologies B.V. (Netherlands); William C. Kress, Toshiba America Information Systems, Inc. (United States); Yee S. Ng, Eastman Kodak Co. (United States); Susan Zoltner, Xerox Corp. (United States) . . . . . [7242-03]

10:10 am: **Measurement of contributing attributes of perceived printer resolution.**, Eric K. Zeise, Eastman Kodak Co. (United States); Sang Ho Kim, SAMSUNG Electronics Co., Ltd. (Korea (Republic of)); Franz Sigg, Rochester Institute of Technology (United States); Brian Cooper, Lexmark International, Inc. (United States) . . . . . [7242-04]

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

### SESSION 2

**Conv. Ctr. Room B3: . . . . . .Mon. 11:00 am to 12:30 pm**

#### Image Quality Standards for Capture and Display

*Session Chair*: **Dirk W. Hertel,** Sensata Technologies, Inc.

11:00 am: **Softcopy Quality Ruler Method: Implementation and Validation** *(Invited Paper)*, Elaine W. Jin, Brian W. Keelan, Junqing Chen, Aptina Imaging (United States); Jonathan B. Phillips, Eastman Kodak Co. (United States); Ying Chen, Vista Point Technologies (United States) . . . . . [7242-05]

11:30 am: **Correlating objective and subjective evaluation of texture appearance with applications to camera phone imaging**, Jonathan B. Phillips, Eastman Kodak Co. (United States); Elaine W. Jin, Aptina Imaging (United States); James H. Clark, Hewlett-Packard Co. (United States); Ying Chen, Vista Point Technologies (United States) . . . . . [7242-06]

11:50 am: **Imaging performance taxonomy**, Donald R. Williams, Image Science Associates (United States); Peter D. Burns, Carestream Health, Inc. (United States); Lawrence A. Scarff, Vista Point Technologies (United States). . [7242-07]

12:10 pm: **Extended use of ISO 15739 incremental signal-to-noise ratio as reliability criterion for multiple-slope wide dynamic range image capture**, Dirk W. Hertel, Sensata Technologies, Inc. (United States) . . . . . [7242-08]

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

### SESSION 3

**Conv. Ctr. Room B3: . . . . . .Mon. 2:00 to 3:00 pm**

#### Subjective Image Quality Evaluation Methodology I

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

2:00 pm: **Web-based psychometric evaluation of image quality**, Iris Sprow, Zofia Baranczuk, Tobias Stamm, Peter Zolliker, EMPA (Switzerland) . . [7242-09]

2:20 pm: **Development of a balanced test image for visual print quality evaluation**, Hanne M. Salmi, Raisa Halonen, Helsinki Univ. of Technology (Finland); Tuomas M. Leisti, Univ. of Helsinki (Finland); Pirkko T. Oittinen, Hannu Saarelma, Helsinki Univ. of Technology (Finland) . . . . . [7242-10]

2:40 pm: **Perceptual image attribute scales derived from overall image quality assessments**, Kyung Hoon Oh, Sophie Triantaphillidou, Ralph E. Jacobson, Univ. of Westminster (United Kingdom) . . . . . [7242-11]

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

### SESSION 4

**Conv. Ctr. Room B3: . . . . . .Mon. 3:30 to 4:50 pm**

#### Subjective Image Quality Evaluation Methodology II

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

3:30 pm: **Subjective experience of image quality: Attributes, definitions and decision making of subjective image quality**, Tuomas M. Leisti, Jenni Radun, Toni Virtanen, Univ. of Helsinki (Finland); Raisa Halonen, Helsinki Univ. of Technology (Finland); Göte Nyman, Univ. of Helsinki (Finland) . . . . . [7242-12]

3:50 pm: **Towards an automatic subjective image quality assessment system**, Majed Chambah, Sonia Ouni, Michel Herbin, Univ. de Reims Champagne-Ardenne (France); Ezzeddine Zagrouba, Institut Supérieur d'Informatique (Tunisia) . . . . . [7242-13]

4:10 pm: **Scroller: a subjective assessment protocol for digital cinema**, Chaker M. Larabi, Ghislain Anciaux, Univ. de Poitiers (France) . . . . . [7242-14]

4:30 pm: **Methods for measuring display defects as correlated to human perception**, Hubert Kostal, Gary Pedeville, Ronald F. Rykowski, Radiant Imaging, Inc. (United States) . . . . . [7242-35]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Research Specialist, Advanced Imaging and Visualization Laboratory, Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 5

**Conv. Ctr. Room B3: . . . . . .Tues. 10:30 to 11:30 am**

**Image Quality Attributes Characterization and Measurement I**

*Session Chair*: **Eric K. Zeise,** Eastman Kodak Co.

10:30 am: **A strobe-based inspection system for drops-in-flight**, Yair Kipman, ImageXpert, Inc. (United States) . . . . . [7242-15]

10:50 am: **Image on paper registration measurement and analysis: determining subsystem contributions from a system level measurement**, Rakesh S. Kulkarni, Abu S. Islam, Daniel W. Costanza, Xerox Corp. (United States) . . . . . [7242-16]

11:10 am: **Effect of bit-depth of image path on image quality of a print engine**, Edgar A. Bernal, Robert P. Loce, Xerox Corp. (United States) . [7242-17]

### SESSION 6

**Conv. Ctr. Room B3: . . . . . Tues. 11:30 am to 12:50 pm**

**Image Quality Attributes Characterization and Measurement II**

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

11:30 am: **Determination of optimal coring values from psychophysical experiments**, Hyung Jun Park, Zygmunt Pizlo, Jan P. Allebach, Purdue Univ. (United States) . . . . . [7242-18]

11:50 am: **Detection of worms in error diffusion halftoning**, Marius Pedersen, Jon Y. Hardeberg, Gjøvik Univ. College (Norway). . . . . [7242-19]

12:10 pm: **Characterization of '2D Noise' print defect**, Ki-Youn Lee, Yousun Bang, Heui-Keun Choh, SAMSUNG Electronics Co., Ltd. (South Korea)[7242-20]

12:30 pm: **Measurement of printer MTFs**, Albrecht Lindner, Nicolas Bonnier, Océ Print Logic Technologies (France) and Ecole Nationale Supérieure des Télécommunications (France); Christophe Leynadier, Océ Print Logic Technologies (France); Francis J. M. Schmitt, Ecole Nationale Supérieure des Télécommunications (France) . . . . . [7242-21]

Lunch/Exhibition Break . . . . . 12:50 to 2:30 pm

### SESSION 7

**Conv. Ctr. Room B3: . . . . . Tues. 2:30 to 3:50 pm**

**Objective Metrics of Perceptual Image Quality I**

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

2:30 pm: **Image quality assessment by preprocessing and full reference model combination**, Simone Bianco, Gianluigi Ciocca, Fabrizio Marini, Raimondo Schettini, Univ. degli Studi di Milano-Bicocca (Italy) . . . . . [7242-22]

2:50 pm: **Image quality assessment with manifold and machine learning**, Christophe M. Charrier, Gilles Lebrun, Olivier Lezoray, Univ. de Caen Basse-Normandie (France) . . . . . [7242-23]

3:10 pm: **Three-Component Weighted Structural Similarity Index**, Chaofeng Li, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . [7242-24]

3:30 pm: **An image similarity metric based on quadtree homogeneity analysis**, Eric P. Lam, Thales-Raytheon Systems Co. LLC (United States) . . . . . [7242-25]

Coffee Break . . . . . 3:50 to 4:20 pm

### SESSION 8

**Conv. Ctr. Room B3: . . . . . Tues. 4:20 to 5:40 pm**

**Objective Metrics of Perceptual Image Quality II**

*Session Chair*: **D. René Rasmussen,** Xerox Corp.

4:20 pm: **The most apparent distortion: a dual strategy for full reference image quality**, Eric C. Larson, Cuong Vu, Damon M. Chandler, Oklahoma State Univ. (United States) . . . . . [7242-26]

4:40 pm: **Low level features for image appeal measurement**, Pere Obrador, Telefonica Research Lab. (Spain); Nathan Moroney, Hewlett-Packard Co. (United States) . . . . . [7242-27]

5:00 pm: **SCID: full reference spatial color image quality metric**, Sonia Ouni, Majed Chambah, Michel Herbin, Univ. de Reims Champagne-Ardenne (France); Ezzeddine Zagrouba, Institut Supérieur d'Informatique (Tunisia) . . . . . [7242-28]

5:20 pm: **An Evaluation of Interactive Image Matting Techniques Supported by Eye - Tracking,** Christoph Rhemann, Margrit Gelautz, Bernhard Fölsner, Technische Univ. Wien (Austria) . . . . . [7242-29]

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

**Interactive Paper and Symposium Demonstration Session**

*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.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**A geometry calibration and visual seamlessness method based on multi-projector tiled display wall**, Yahui Liu, Beijing Univ. of Posts and Telecommunications (China) . . . . . [7242-47]

**A facial expression image database and norm for Asian population: A preliminary report**, Chien-Chung Chen, National Taiwan Univ. (Taiwan); Shu-ling Cho, Fu-Jen Catholic Univ. (Taiwan); Katarzyna Horszowska, Mei-Yen Chen, National Taiwan Univ. (Taiwan); Hsueh-Chih Chen, National Taiwan Normal Univ. (Taiwan); Yi-Yu Yeh, Chao-Min Cheng, National Taiwan Univ. (Taiwan) [7242-48]

## Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 9

**Conv. Ctr. Room B3: . . . . . Wed. 9:30 to 10:10 am**

**System Performance: Advanced Display Technologies**

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

9:30 am: **Perception of detail in 3D images**, Ingrid E. J. Heynderickx, Philips Research (Netherlands) and Delft Univ. of Technology (Netherlands); Ronald Kaptein, Philips Research (Netherlands) . . . . . [7242-30]

9:50 am: **Perception of time variable quality of scene objects**, Leif Arne Ronningen, Erlend Heiberg, Norwegian Univ. of Science and Technology (Norway) . . . . . [7242-45]

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

### SESSION 10

**Conv. Ctr. Room B3: . . . . . Wed. 10:40 am to 12:00 pm**

**System Performance: Capture and Display**

*Session Chair*: **Peter D. Burns,** Carestream Health, Inc.

10:40 am: **Scanner image quality profiling**, Luke C. Cui, Lexmark International, Inc. (United States) . . . . . [7242-32]

11:00 am: **Weighting of field heights for sharpness and noisiness**, Brian W. Keelan, Elaine W. Jin, Aptina Imaging (United States) . . . . . [7242-33]

11:20 am: **Identification of image attributes that are most affected with changes in displayed image size**, Jae-Young Park, Sophie Triantaphillidou, Ralph E. Jacobson, Univ. of Westminster (United Kingdom) . . . . . [7242-34]

11:40 am: **Simulation of film media in motion picture production using a digital still camera**, Arne M. Bakke, Jon Y. Hardeberg, Steffen Paul, Gjøvik Univ. College (Norway) . . . . . [7242-50]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

### SESSION 11

**Conv. Ctr. Room B3: . . . . . Wed. 1:30 to 3:10 pm**

**System Performance: Mobile Phones and CMOS Cameras**

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

1:30 pm: **Method for measuring the objective image quality of TV-out function of mobile handsets**, Mikko Nuutinen, Pirkko T. Oittinen, Helsinki Univ. of Technology (Finland) . . . . . [7242-36]

1:50 pm: **Applying image quality in cell phone cameras: lens distortion**, Donald J. Baxter, STMicroelectronics (United Kingdom); Sergio R. Goma, Aleksic Milivoje, Advanced Micro Devices, Inc. (Canada) . . . . . [7242-37]

2:10 pm: **Low light performance of camera phones**, Bror Hultgren, Image Integration, Inc. (United States); Dirk W. Hertel, Sensata Technologies, Inc. (United States) . . . . . [7242-38]

2:30 pm: **Color-blotch noise characterization using spectral image processing for CMOS cameras**, Reza Safaee-Rad, Milivoje Aleksic, Advanced Micro Devices, Inc. (Canada) . . . . . [7242-39]

2:50 pm: **Photo-response non-uniformity error tolerance testing methodology for CMOS imager systems**, Brent McCleary, Raytheon Space & Airborne Systems (United States) . . . . . [7242-40]

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

### SESSION 12

**Conv. Ctr. Room B3: . . . . . Wed. 3:40 to 5:20 pm**

**System Performance: Video**

*Session Chair*: **Majed Chambah,** Univ. de Reims Champagne-Ardenne (France)

3:40 pm: **Improved video image by pixel-based learning for super-resolution**, Kenji Kamimura, Norimichi Tsumura, Toshiya Nakaguchi, Chiba Univ. (Japan); Hideto Motomura, Matsushita Electric Industrial Co., Ltd. (Japan); Yoichi Miyake, Chiba Univ. (Japan) . . . . . [7242-41]

4:00 pm: **Subjective video quality comparison of HDTV monitors**, Guiwon Seo, Changsun Leem, Sangwook Lee, Chulhee Lee, Yonsei Univ. (Korea, Republic of) . . . . . [7242-42]

4:20 pm: **Constructing a metrics for blur perception with blur discrimination experiments**, Chien-Chung Chen, Kuei-Po Chen, Chia-Hui Tseng, National Taiwan Univ. (Taiwan); Hseng-Tzung Kuo, Industrial Technology Research Institute (Taiwan) . . . . . [7242-43]

4:40 pm: **Objective perceptual picture quality measurement method for high-definition video based on full reference framework**, Osamu Sugimoto, Sei Naito, Shigeyuki Sakazawa, Atsushi Koike, KDDI R&D Labs., Inc. (Japan) . . . . . [7242-44]

5:00 pm: Motion blur perception considering anisotropic contrast sensitivity of human visual system, Shinji Nakagawa, Toshiya Nakaguchi, Norimichi Tsumura, Yoichi Miyake, Chiba Univ. (Japan) . . . . . [7242-46]

**Conv. Ctr. Room A3/A6: . . . . . Wed. 6:00 to 7:00 pm**

**Discussion Session: Image Analysis and Quality**

*Joint Discussion Session with Conference 7240, Human Vision and Electronic Imaging*

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC762 Device Simulation for Image Quality Evaluation (Farrell, Catrysse) Thursday, 8:30 am to 12:30 pm |
| SC812 Perceptual Metrics for Image Quality Evaluation (Pappas, Hemami) Sunday, 1:30 to 5:30 pm |
| SC871 Noise, Image Processing, and their Influence on Resolution (Matherson, Wueller) Sunday, 1:30 to 5:30 pm |
| SC899 Visual Ergonomics and Aesthetics in Electronic Imaging (van Nes) Sunday, 8:30 am to 12:30 pm |

# Conference 7243

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7243

# Visualization and Data Analysis 2009

*Conference Chairs:* **Katy Börner,** Indiana Univ.; **Jinah Park,** Information and Communications Univ. (South Korea)

*Conference Co-Chairs:* **Matti T. Gröhn,** Ctr. for Scientific Computing (Finland); **Ming C. Hao,** Hewlett-Packard Labs.; **Jonathan C. Roberts,** Bangor Univ. (United Kingdom); **Pak Chung Wong,** Pacific Northwest National Lab.

*Program Committee:* **Uwe Brinkschulte,** Univ. Karlsruhe (Germany); **Paul Craig,** Napier Univ. (United Kingdom); **Steve Eick,** Visual Insights; **Robert F. Erbacher,** Utah State Univ.; **Zhanping Liu,** Mississippi State Univ.; **Joerg Meyer,** Univ. of California/Irvine; **Hans-Georg Pagendarm,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Alex T. Pang,** Univ. of California/Santa Cruz; **Aaron J. Quigley,** National Univ. of Ireland/Dublin (Ireland); **Deborah E. Silver,** Rutgers Univ.; **Kalpathi R. Subramanian,** The Univ. of North Carolina at Charlotte; **Yinlong Sun,** Purdue Univ.; **J. Edward Swan II,** Naval Research Lab.; **Yingcai Xiao,** Univ. of Akron; **William J. Yurcik,** Univ. of Illinois at Urbana-Champaign

*Sponsored by:* hp

## Monday 19 January

**Conv. Ctr. Room C1: . . . . . .Mon. 9:00 to 10:00 am**

**Welcome**

**Invited Presentation**

9:30 am: **Visualizing roles in social media** *(Invited Paper, Presentation Only)*, Marc Smith, Telligent Systems, Inc. (United States) . . . . . [7243-01]

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

### SESSION 1

**Conv. Ctr. Room C1: . . . . . .Mon. 10:30 am to 12:00 pm**

**Visualizing Mind and Body: Bioinformatic Applications**

10:30 am: **Analytics for massive heat maps**, Shawn J. Bohn, Deborah Payne, Grant Nakamura, Douglass Love, Pacific Northwest National Lab. (United States) . . . . . [7243-02]

11:00 am: **Asymmetry analysis based on genetic algorithms for the prediction of foot ulcers**, Naima Kaabouch, Yi Chen, Julie Anderson, Forrest Ames, Univ. of North Dakota (United States); Rolf Paulson, Altru Wound Clinic (United States) . . . . . [7243-03]

11:30 am: **Computer assisted analysis of microscopy images** *(Short Paper)*, Monica S. Sawicki, Paida Munhutu, John S. DaPonte, C. Caragianis-Broadbridge, Southern Connecticut State Univ. (United States); Ann Lehman, Trinity College (United States); Thomas J. Sadowski, E. Garcia, C. Heyden, L. Mirabelle, P. Benjamin, Southern Connecticut State Univ. (United States) . . . . . [7243-04]

11:45 am: **Visualizing conserved gene location across microbe genomes** *(Short Paper)*, Christopher D. Shaw, Simon Fraser Univ. Surrey (Canada) . . . . . [7243-05]

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

### SESSION 2

**Conv. Ctr. Room C1: . . . . . .Mon. 2:00 to 5:15 pm**

**Visualizing Internal and External Spaces: Geographic, Semantic, Scientific**

2:00 pm: **Teaching children the structure of science**, Katy Börner, Indiana Univ. (United States); Stephen M. Uzzo, The New York Hall of Science (United States); Fileve Palmer, Julie M. Davis, Elisha F. Hardy, Bryan J. Hook, Indiana Univ. (United States) . . . . . [7243-06]

2:30 pm: **An Adaptive Spread Spectrum (SS) Synchronous Data Hiding Strategy for Scalable 3D Terrain Visualization**, Khizar Hayat, William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); Gilles Gesquière, Univ. of Marseille (France) . . . . . [7243-07]

3:00 pm: **Visual data exploration of temporal graph data** *(Short Paper)*, Michael Farrugia, Aaron J. Quigley, Univ. College Dublin (Ireland) . . . . . [7243-08]

Coffee Break . . . . . 3:15 to 3:45 pm

3:45 pm: **Visual analytics of anomaly detection in large data streams**, Ming C. Hao, Umeshwar Dayal, Hewlett-Packard Labs. (United States); Daniel A. Keim, Univ. of Konstanz (Germany) . . . . . [7243-10]

4:15 pm: **Musician Map: visualizing music collaborations over time**, Ji-Dong Yim, Chris Shaw, Simon Fraser Univ. Surrey (Canada); Lyn Bartram, Simon Fraser Univ Surrey (Canada) . . . . . [7243-09]

4:45 pm: **Understanding outside collaborations of the Chinese Academy of Sciences using Jensen-Shannon Divergence,** Russell J. Duhon, Indiana Univ. (United States) . . . . . [7243-11]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

**Conv. Ctr. Room C1: . . . . . .Tues. 10:30 to 11:00 am**

**Open Laptop Session**

### SESSION 3

**Conv. Ctr. Room C1: . . . . . Tues. 11:00 am to 12:30 pm**

**Visualizing to Explicate: Organization, Information Resources, Scientific Discovery I**

11:00 am: **A graphical environment for interactive four-dimensional data navigation** *(Short Paper)*, Daniel R. Wilding, Robert P. Burton, Brigham Young Univ. (United States) . . . . . [7243-14]

11:15 am: **BrainFrame: a knowledge visualization system for the neurosciences** *(Short Paper)*, Steven J. Barnes, Christopher D. Shaw, Simon Fraser Univ. (Canada) . . . . . [7243-15]

11:30 am: **A main path domain map as digital library interface**, Jeffrey Demaine, National Research Council Canada (Canada) . . . . . [7243-16]

12:00 pm: **A unified toolkit for information and scientific visualization**, Brian Wylie, Sandia National Labs. (United States); Jeffrey Baumes, Kitware, Inc. (United States) . . . . . [7243-17]

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

## SESSION 4

**Conv. Ctr. Room C1: . . . . . Tues. 2:00 to 5:00 pm**

### Visualizing to Explicate: Organization, Information Resources, Scientific Discovery II

2:00 pm: **Progressive refinement -- more than a means to overcome limited bandwidth**, René U. Rosenbaum, Sr., Heidrun Schumann, Univ. Rostock (Germany) . . . . . [7243-19]

2:30 pm: **Visually comparing multiple partitions of data with applications to clustering**, Jianping Zhou, Univ. of Massachusetts, Lowell (United States); Shawn Konecni, ; Georges G. Grinstein, Univ. of Massachusetts, Lowell (United States) . . . . . [7243-20]

3:00 pm: **Uncertainty visualization in the VisIt visualization environment**, Andrew Foulks, R. Daniel Bergeron, Univ. of New Hampshire (United States) . . . . . [7243-21]

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

4:00 pm: **Reservoir Model Information System: REMIS**, Sang Yun Lee, Kwangwoo Lee, Taehyun Rhee, Ulrich Neumann, Univ. of Southern California (United States). . . . . [7243-22]

4:30 pm: **Multiresolution Data Aggregation for Analytical Exploration of Large Relational Data,** Mustafa Sanver, NYIT Abu Dhabi (United Arab Emirates); Li Yang, Western Michigan Univ. (United States) . . . . . [7243-23]

**Conv. Ctr. Room C1: . . . . . Tues. 5:00 to 5:20 pm**

### Closing Remarks

# Conference 7244

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7244

# Real-Time Image and Video Processing

*Conference Chairs:* **Nasser Kehtarnavaz,** The Univ. of Texas at Dallas; **Matthias F. Carlsohn,** Computer Vision & Image Communication (Germany

*Program Committee:* **Mohamed Akil,** École Supérieure d'Ingénieurs en Électronique et Électrotechnique (France); **Chang Y. Choo,** San José State Univ.; **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany); **Philip P. Dang,** STMicroelectronics; **Sergio R. Goma,** ATI Technologies Inc. (Canada); **Christos Grecos,** Univ. of Central Lancashire (United Kingdom); **Rastislav Lukac,** Univ. of Toronto (Canada); **Antonio Núñez Ordóñez,** Univ. de Las Palmas de Gran Canaria (Spain); **Volodymyr I. Ponomaryov,** Instituto Politécnico Nacional (Mexico); **Fatih M. Porikli,** Mitsubishi Electric Research Labs.; **Luis L. Salgado,** Univ. Politécnica de Madrid (Spain); **Mukul V. Shirvaikar,** The Univ. of Texas at Tyler; **Stephan Stilkerich,** EADS Astrium GmbH (Germany); **Shan Suthaharan,** The Univ. of North Carolina System; **Leonid P. Yaroslavsky,** Tel Aviv Univ. (Israel)

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room C3:. . . . . .Mon. 8:00 to 10:10 am**

#### Real-Time Hardware

*Session Chair*: **Nasser Kehtarnavaz,** The Univ. of Texas at Dallas

8:00 am: **Iris Matching with Configurable Hardware** *(Invited Paper)*, Ryan N. Rakvic, Randy P. Broussard, U.S. Naval Academy (United States); Delores M. Etter, Southern Methodist University (United States); Lauren R. Kennell, James R. Matey, U.S. Naval Academy (United States). . . . . [7244-01]

8:30 am: **Image segmentation based upon topological operators: real-time implementation case study**, Ramzi Mahmoudi, Mohamed Akil, École Supérieure d'Ingénieurs en Electronique et Electrotechnique (France). . . . . [7244-02]

8:50 am: **Real-time embedded atmospheric compensation for long-range imaging using the average bispectrum speckle method**, Petersen F. Curt, Michael R. Bodnar, Fernando E. Ortiz, EM Photonics, Inc. (United States); Carmen J. Carrano, Lawrence Livermore National Lab. (United States); Eric J. Kelmelis, EM Photonics, Inc. (United States) . . . . . [7244-03]

9:10 am: **Grayscale Image Segmentation for Real-time Traffic Sign Recognition: the Hardware Point of View**, Tam P. Cao, Guang Deng, Darrell M. Elton, La Trobe Univ. (Australia) . . . . . [7244-04]

9:30 am: **A comparison between DSP and FPGA platforms for real-time image processing applications**, Mukul V. Shirvaikar, Tariq Bushnaq, The Univ. of Texas at Tyler (United States) . . . . . [7244-05]

9:50 am: **Hardware architecture to accelerate the belief propagation algorithm for a Wyner-Ziv video decoder**, Thomas A. Horvath, IBM Thomas J. Watson Research Ctr. (United States); Da-ke He, Univ. of Waterloo (Canada) . . . . . [7244-06]

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

### SESSION 2

**Conv. Ctr. Room C3:. . . . . .Mon. 10:40 am to 12:00 pm**

#### Real-Time Camera Systems

*Session Chair*: **Mukul V. Shirvaikar,** The Univ. of Texas at Tyler

10:40 am: **Real-time implementation of single-shot passive auto focus on DM350 digital camera processor**, Mark N. Gamadia, Nasser Kehtarnavaz, The Univ. of Texas at Dallas (United States) . . . . . [7244-07]

11:00 am: **Real-time development system for image processing engines**, Sergio R. Goma, Radu V. Gheorghe, Milivoje Aleksic, Advanced Micro Devices, Inc. (Canada) . . . . . [7244-08]

11:20 am: **Bayer bilateral denoising on TriMedia3270**, Harold Phelippeau, Univ. Paris-Est (France) and NXP Semiconductors (France); Mohamed Akil, Univ. Paris-Est (France); Breno Dias Rodrigues, Univ. Federal de Minas Gerais (Brazil); Hugues Talbot, Univ. Paris-Est (France); Bara Stefan, NXP Semiconductors (France) . . . . . [7244-09]

11:40 am: **Real-Time Global Motion Estimation for Video Stabilization**, Touraj Tajbakhsh, Hamburg University of Technology (Germany). . . . . [7244-10]

Lunch Break . . . . . 12:00 to 1:30 pm

### SESSION 3

**Conv. Ctr. Room C3: . . . . . .Mon. 1:30 to 3:10 pm**

#### Real-Time Video Processing

*Session Chair*: **Matthias F. Carlsohn,** Computer Vision & Image Communication (Germany)

1:30 pm: **Selective application of sub-pixel motion estimation and Hadamard transform in H264 AVC**, Christos Grecos, Abdelrahman Abdelazim, Mingyuan Yang, Djamel Ait-Boudaoud, Univ. of Central Lancashire (United Kingdom) . . . . . [7244-11]

1:50 pm: **Real-time Detection and Tracking of Multiple Objects with Partial Decoding in H.264|AVC Bitstream Domain**, Wonsang You, M.S. Houari Sabirin, Munchurl Kim, Information and Communications Univ. (South Korea). . [7244-12]

2:10 pm: **Adaptive interpolation filter method for improving coding efficiency in H.264/AVC**, Kun Su Yoon, Pusan National Univ. (South Korea); Hyun Woo Cho, Pusan Nation University (Korea, Republic of) . . . . . [7244-13]

2:30 pm: **Video calibration for spatial-temporal registration with gain and offsets adjustments**, Chulhee Lee, Jonghwa Lee, Guiwon Seo, Yonsei Univ. (Korea, Republic of). . . . . [7244-14]

2:50 pm: **Real-time visual tracking system modelling in MPSoC using platform based design**, Zai-Jian Jia, Tomás Bautista Delgado, Antonio Nuñez Ordónez, Cayetano Guerra Artal, Mario Hernández Tejera, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [7244-15]

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

### SESSION 4

**Conv. Ctr. Room C3:. . . . . .Mon. 3:40 to 5:20 pm**

#### Real-Time Algorithms

*Session Chair*: **Christos Grecos,** Univ. of Central Lancashire (United Kingdom)

3:40 pm: **Real-time vehicle detection and tracking based on perspective and non-perspective space cooperation**, Jon Arróspide, Luis L. Salgado, Marcos Nieto, Fernando F. Jaureguizar, Univ. Politécnica de Madrid (Spain). . . [7244-16]

4:00 pm: **Real-time vision-based traffic flow measurements and incident detection**, Barak Fishbain, Ianir A. Ideses, Tel Aviv Univ. (Israel); David Mahalel, Technion-Israel Institute of Technology (Israel); Leonid Yaroslvasky, Tel Aviv Univ. (Israel) . . . . . [7244-17]

4:20 pm: **Real-time depth map manipulation for 3D visualization**, Ianir A. Ideses, Leonid P. Yaroslavsky, Barak Fishbain, Tel Aviv Univ. (Israel) . . [7244-18]

4:40 pm: **Accelerating sub-pixel marker segmentation using GPU**, Holger Handel, Univ. Mannheim (Germany) . . . . . [7244-19]

5:00 pm: **Fuzzy-Set and Directional Image Processing Techniques for Impulsive Noise Reduction Employing DSP**, Volodymyr I. Ponomaryov, Alberto Rosales-Silva, Francisco Gallegos-Funes, Instituto Politécnico Nacional (Mexico). . . . . [7244-20]

## Tuesday 20 January

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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 Paper session.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Correction of artifacts in correlated double-sampled CCD video resulting from insufficient bandwidth**, Robert H. Philbrick, Ball Aerospace & Technologies Corp. (United States) . . . . . [7244-21]

**Unsupervised exposure correction for video**, Xenya Petrova, Sergey Sedunov, Artyom Ignatov, SAMSUNG Electronics Co., Ltd. (Russia). . . . . [7244-22]

**Determination of vehicle speed in traffic video**, Mehrube Mehrubeoglu, Texas A&M Univ.-Corpus Christi (United States); Lifford McLauchlan, Texas A&M Univ.-Kingsville (United States). . . . . [7244-23]

**Fast disparity-motion estimation based 4-view video coding using optical calibration system**, Kyung-Hoon Bae, Yeonggi Kwon, Hyundo Kim, Samsung Thales Co., Ltd. (Korea, Republic of) . . . . . [7244-24]

**Low power multi-core scalable fully programmable Digital Media Silicon, DMS, for next generation handheld digital cinema**, Hasan Gadjali, 3DLabs Semiconductor (United States) . . . . . [7244-27]

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm |
| SC766 Information Processing for Video Surveillance (Ebrahimi, Dufaux) Tuesday, 8:30 am to 5:30 pm |
| SC809 Real-Time Image and Video Processing (Kehtarnavaz) Sunday, 8:30 am to 12:30 pm |
| SC813 MPEG Family of Video Compression Standards (Rabbani) Monday, 8:30 am to 5:30 pm |
| SC928 FPGA Design of Video and Image Processing Algorithms (Choo) Monday, 8:30 am to 5:30 pm |

# Conference 7245A

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7245A

# Image Processing: Algorithms and Systems VII

*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 D. Gader,** Univ. of Florida; **Atanas P. Gotchev,** Tampere Univ. of Technology (Finland); **John C. Handley,** Xerox Corp.; **Vladimir Vasilyevich 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); **Ivan W. Selesnick,** Polytechnic Univ.; **Akira Taguchi,** Musashi Inst. of Technology (Japan)

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room B4: . . . . . Mon. 8:40 to 10:00 am**

**Transform Methods**

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

8:40 am: **Discrete integer Fourier transform in real space: elliptic Fourier transform**, Artyom M. Grigoryan, The Univ. of Texas at San Antonio (United States); Merughan M. Grigoryan, Yerevan State Univ. (Armenia) . . . . . [7245A-01]

9:00 am: **Reversible integer 2D Fourier transform**, Elias Gonzalez, Artyom M. Grigoryan, The Univ. of Texas at San Antonio (United States) . . . . . [7245A-02]

9:20 am: **On the use of the Stockwell Transform for image compression**, Yanwei Wang, Univ. of Waterloo (Canada); Jeffery J. Orchard, Univ. of Waterloo (Canada) and Scientific Computation Group (Canada) and Waterloo Institute for Health Informatics Research (Canada) . . . . . [7245A-03]

9:40 am: **B-term approximation using tree-structured Haar transforms**, Hsin-Han Ho, Univ. of California, Santa Barbara (United States); Karen O. Egiazarian, Tampere Univ. of Technology (Finland); Sanjit K. Mitra, Univ. of California, Santa Barbara (United States) . . . . . [7245A-04]

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

### SESSION 2

**Conv. Ctr. Room B4: . . . . . Mon. 10:30 am to 12:10 pm**

**Image Restoration**

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

10:30 am: **Local adaptive filtering of images corrupted by nonstationary noise**, Vladimir V. Lukin, Dmitriy V. Fevralev, Nikolay N. Ponomarenko, National Aerospace Univ. (Ukraine); Oleksiy B. Pogrebnyak, Instituto Politécnico Nacional (Mexico); Karen O. Egiazarian, Jaakko T. Astola, Tampere Univ. of Technology (Finland) . . . . . [7245A-05]

10:50 am: **Noise Reduction Using Multi-resolution Edge Detection**, Bo Jiang, Zia-Ur Rahman, Old Dominion Univ. (United States) . . . . . [7245A-06]

11:10 am: **Red Eye Reduction Using Color and Shape**, Leena Lepisto, Nokia Corp. (Finland); Aki Launiainen, Nokia Corporation (France) . . . . . [7245A-07]

11:30 am: **Image Restoration Regularized by a Fourth-Order PDE**, Wenhua Ma, Guangdong Univ. of Foreign Studies (China); Yu-Li You, Mostafa Kaveh, Univ. of Minnesota, Twin Cities (United States) . . . . . [7245A-08]

11:50 am: **Texture preservation in de-noising UAV surveillance video through multi-frame sampling**, Yi Wang, Ronald A. Fevig, Richard R. Schultz, Univ. of North Dakota (United States) . . . . . [7245A-09]

Lunch Break . . . . . 12:10 to 1:40 pm

### SESSION 3

**Conv. Ctr. Room B4: . . . . . Mon. 1:40 to 3:00 pm**

**Image Processing Algorithms I**

*Session Chair*: **Atanas P. Gotchev,** Tampere Univ. of Technology (Finland)

1:40 pm: **Geodesic distance approximation using mesh decimation and front propagation**, Joachim Giard, Benoit Macq, Univ. Catholique de Louvain (Belgium) . . . . . [7245A-10]

2:00 pm: **Image object removal in redundant wavelet transform domain**, Yonghui Wang, Suxia Cui, Jian-ao Lian, Cajetan M. Akujuobi, Prairie View A&M Univ. (United States) . . . . . [7245A-11]

2:20 pm: **Nonlinear mapping of the luminance in dual-layer high dynamic range displays**, Gabriele Guarnieri, Giovanni Ramponi, Univ. degli Studi di Trieste (Italy); Silvio Bonfiglio, Luigi Albani, FIMI (Italy) . . . . . [7245A-12]

2:40 pm: **Color image enhancement in a high-dynamic range environment**, Stefano Marsi, Alfredo Restrepo, Univ. degli Studi di Trieste (Italy) . . . [7245A-13]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 4

**Conv. Ctr. Room B4: . . . . . Tues. 10:30 am to 12:10 pm**

**Image Processing Algorithms II**

*Session Chair*: **Sos S. Agaian,** The Univ. of Texas at San Antonio

10:30 am: **Active contours that grow and compete driven by local region descriptors**, Cristina Darolti, Christoph Bodensteiner, Erhardt Barth, Ulrich G. Hofmann, Univ. zu Lübeck (Germany). . . . . [7245A-14]

10:50 am: **A fast intensity based non-rigid 2D-3D-registration using statistical shape models with application in radiotherapy**, Christoph Bodensteiner, Cristina Darolti, Achim Schweikard, Univ. zu Lübeck (Germany) . . . . . [7245A-15]

11:10 am: **Morphological demosaicking**, Shuxue Quan, Micron Technology, Inc. (United States) . . . . . [7245A-16]

11:30 am: **A Kernel Representation for Exponential Splines with Global Tension**, Sven Barendt, Bernd Fischer, Institute of Mathematics, University of Luebeck, SH (Germany); Jan Modersitzki, Department of Computing and Software, McMaster University, Hamilton, ON (Canada) . . . . . [7245A-17]

11:50 am: **Compression of multispectral fluorescence microscopic images based on a modified set partitioning in hierarchal trees**, Awais Mansoor, J. Paul Robinson, Bartek P. Rajwa, Purdue Univ. (United States) . . . . . [7245A-18]

Lunch/Exhibition Break . . . . . 12:10 to 1:30 am

## SESSION 5

**Conv. Ctr. Room B4: . . . . . Tues. 1:30 to 2:30 pm**

### Image Processing Algorithms III

*Session Chair*: **Giovanni Ramponi,** Univ. degli Studi di Trieste (Italy)

1:30 pm: **Robust Measurement of the Blocking Artefact**, Giovanni Ramponi, Leonardo Abate, Univ. degli Studi di Trieste (Italy) . . . . . .[7245A-19]

1:50 pm: **Object recognition based on shape using angular radius Fourier descriptor**, Iivari Kunttu, Leena Lepisto, Nokia Corp. (Finland) . . . . . .[7245A-20]

2:10 pm: **Non-uniform sampling, signal and image recovery from sparse data and the discrete sampling theorem**, Leonid P. Yaroslavsky, Gil Shabat, Barak Fishbain, Ben Gur Salomon, Ianir Ideses, Tel Aviv Univ. (Israel). . . . . .[7245A-21]

## SESSION 6

**Conv. Ctr. Room B4: . . . . . Tues. 2:30 to 3:30 pm**

### Image Processing Systems

2:30 pm: **Concurrent grammar inference machines for 2-D pattern recognition: a comparison with the level set approach**, K. P. Lam, Peter Fletcher, Keele Univ. (United Kingdom) . . . . . .[7245A-22]

2:50 pm: **Ensemble registration: aligning many multi-sensor images simultaneously**, Jeffery J. Orchard, Univ. of Waterloo (Canada); Laure Jonchery, Ecole Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble (France) . . . . . .[7245A-23]

3:10 pm: **Steganography in the generalized Fibonacci domain,** Elena Mammi, Federica Battisti, Marco Carli, Alessandro Neri, Univ. degli Studi di Roma Tre (Italy); Karen O. Egiazarian, Tampere Univ. of Technology (Finland) . .[7245A-24]

**Room: Conv. Ctr. Exhibit Hall 1 . . . . . Tues. 8:00 to 10:00 pm**

### Interactive Paper and Symposium Demonstration Session

*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.*

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**Decomposition by series direction images: image reconstruction and enhancement**, Artyom M. Grigoryan, The Univ. of Texas at San Antonio (United States) . . . . . .[7245A-25]

**Eye blink detection based on eye contour extraction**, Liting Wang, Xiaoqing Ding, Chi Fang, Changsong Liu, Tsinghua Univ. (China); Kongqiao Wang, Nokia Research Ctr. (China) . . . . . .[7245A-26]

**A method for dynamic object tracking using partial shape matching and color image segmentation**, Andre Martin, Eli Saber, Rochester Institute of Technology (United States) . . . . . .[7245A-27]

**Precision Feature Point Tracking Method Using a Drift-Correcting Template Update Strategy**, Xiaoming Peng, Univ. of Electronic Science and Technology of China (China); Qian Ma, Qiheng Zhang, Institute of Optics and Electronics (China); Wufan Chen, Univ. of Electronic Science and Technology of China (China); Zhiyong Xu, Institute of Optics and Electronics (China). . . . . .[7245A-28]

**A generalization of the Frei and Chen kernels for higher dimensions**, Shahan C. Nercessian, Karen A. Panetta, Tufts Univ. (United States); Sos S. Agaian, The Univ. of Texas at San Antonio (United States) . . . . . .[7245A-29]

**Comparative study of methods for recognition an unknown person's action from a video sequence**, Takayuki Hori, Jun Ohya, Waseda Univ. (Japan); Jun Kurumisawa, Chiba Univ. of Commerce (Japan) . . . . . .[7245A-30]

**Efficient Detection of Ellipses from an Image by a Guided Modified RANSAC**, Yingdi Xie, Waseda Univ. (Japan); Yiping Zhao, Jun Ohya, Waseda University (Japan). . . . . .[7245A-31]

**Adaptive image restoration using a proximity measure to boundary**, Sang Hoon Lee, Kyungwon Univ. (Korea (Republic of)) . . . . . .[7245A-33]

**Multichannel Image Processing by use the Median M-type L-filter**, Antonio Toledo-Lopez, Francisco J. Gallegos-Funes, Volodymyr Ponomaryov, Instituto Politécnico Nacional (Mexico) . . . . . .[7245A-34]

**Robustness and security assessment of image watermarking techniques by a stochastic approach**, Valentina Conotter, Giulia Boato, Francesco G. B. De Natale, Univ. of Trento (Italy) . . . . . .[7245A-35]

**Template matching based on quadtree Zernike's decomposition**, Veronica Palma, Marco Carli, Alessandro Neri, Univ. degli Studi di Roma Tre (Italy) . . . . . .[7245A-36]

**A distributed coding approach for stereo sequences in the Tree Strcutre Haar Transform domain**, Michela Cancellaro, Marco Carli, Alessandro Neri, Univ. degli Studi di Roma Tre (Italy) . . . . . .[7245A-37]

**Hyper-spectral image segmentation using spectral clustering with covariance descriptors**, Olcay Kursun, Bahcesehir Univ. (Turkey); Fethullah Karabiber, Istanbul Univ. (Turkey); Abdullah Bal, Yildiz Teknik Univ. (Turkey) . . . . . .[7245A-38]

## Courses of Related Interest

*Register for courses on-site!*

SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm

# Conference 7245B

Thursday 22 January 2009 • Proceedings of SPIE Vol. 7245B

# Applications of Artificial Neural Networks in Image Processing XII

*Conference Chairs:* **Nasser M. Nasrabadi,** Army Research Lab.; **Syed A. Rizvi,** CUNY/College of Staten Island

## Tuesday 20 January

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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.*

*Interactive paper authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Nonlinear manifold discriminant embedding for face recognition**, Praveen Sankaran, K. Vijayan Asari, Old Dominion Univ. (United States). . . . . .[7245B-50]

**Juxta-pleural pulmonary nodule detection algorithm using template-based PCNNs**, Jun Lai, Weixing Wang, Univ. of Electronic Science and Technology of China (China). . . . . .[7245B-51]

**An edge detection algorithm on cellular neural network for rock grain images**, Changtao He, Weixing Wang, Lei Li, Univ. of Electronic Science and Technology of China (China) . . . . . .[7245B-52]

**Semantic home video categorization**, Hyun-Seok Min, Young Bok Lee, Wesley De Neve, Yong Man Ro, Information and Communications Univ. (South Korea) . . . . . .[7245B-45]

## Thursday 22 January

### SESSION 1

**Conv. Ctr. Room B1: . . . . . .Thurs. 9:00 to 11:10 am**

### Neural Networks Application in Image Processing I

*Session Chair*: **Nasser M. Nasrabadi,** Army Research Lab.

9:00 am: **Minimization of color halftone texture visibility using three-dimensional error diffusion neural network**, Wenli Huang, Eugene K. Ressler, Jr., Barry L. Shoop, U.S. Military Academy (United States) . . . . . .[7245B-40]

9:20 am: **Application of SGRBF for Level Set Based Image Segmentation**, Yingxuan Zhu, Syracuse Univ. (United States); Miyoung Shin, Kyungpook National Univ. (South Korea); Amrit L. Goel, Syracuse Univ. (United States) . . . . . .[7245B-41]

9:40 am: **Concurrent grammar inference machines for 2D pattern recognition: a comparison with the level set approach**, Ka Po Lam, Peter Fletcher, Keele Univ. (United Kingdom) . . . . . .[7245B-42]

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

10:30 am: **A vector approach to oil spill detection on multispectral MERIS imagery**, Cataldo Guaragnella, Andrea Guerriero, Politecnico di Bari (Italy); Raffaella Matarrese, Univ. di Bari (Italy); Francesco Ragni, Politecnico di Bari (Italy) . . . . . .[7245B-43]

10:50 am: **Robust image retrieval from noisy inputs using lattice associative memories**, Gonzalo Urcid-Serrano, José Angel Nieves-Vázquez, Anmi García-Arellano, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . .[7245B-44]

Lunch Break . . . . . 11:10 am to 1:00 pm

### SESSION 2

**Conv. Ctr. Room B1: . . . . . .Thurs. 1:00 to 2:20 pm**

### Neural Networks Application in Image Processing II

*Session Chair*: **Nasser M. Nasrabadi,** Army Research Lab.

1:00 pm: **Principle and design of a dynamic neural network for efficient and accurate recognition of a time-varying object based on its static patterns and the dynamic characteristic of how the pattern varies in time**, Chia-Lun J. Hu, Univ. of Colorado at Boulder (United States) . . . . . .[7245B-46]

1:20 pm: **Efficient implementation of neural network deinterlacing**, Guiwon Seo, Chulhee Lee, Yonsei Univ. (Korea, Republic of) . . . . . .[7245B-47]

1:40 pm: **Optimal Input Size for Neural Network De-interlacing**, Hyunsoo Choi, Guiwon Seo, Chulhee Lee, Yonsei Univ. (Korea, Republic of) . .[7245B-48]

2:00 pm: **Edge Detection Algorithms Implemented on Bi-i Cellular Vision System**, Fethullah Karabiber, Sabri Arik, Istanbul Univ. (Turkey) . . . . .[7245B-49]

## Courses of Related Interest

*Register for courses on-site!*

SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm

# Conference 7246

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7246

# Computational Imaging VII

*Conference Chairs:* **Charles A. Bouman,** Purdue Univ.; **Eric L. Miller,** Tufts Univ.; **Ilya Pollak,** Purdue Univ.

*Program Committee:* **Samit Basu,** GE Global Research; **Thomas S. Denney, Jr.,** Auburn Univ.; **Peter C. Doerschuk,** Cornell Univ.; **Peyman Milanfar,** Univ. of California/Santa Cruz; **Joseph A. O'Sullivan,** Washington Univ. in St. Louis; **Zygmunt Pizlo,** Purdue Univ.; **Stanley J. Reeves,** Auburn Univ.; **Yongyi Yang,** Illinois Institute of Technology

## Monday 19 January

**Conv. Ctr. Room K: . . . . . .Mon. 8:30 to 9:00 am**

### Keynote Presentation

*Session Chair*: **Eric L. Miller,** Tufts Univ.

8:30 am: **To Be Announced** *(Invited Paper)*, Badrinath Roysam, Rensselaer Polytechnic Institute (United States) . . . . . [7246-51]

### SESSION 1

**Conv. Ctr. Room K:. . . . . .Mon. 9:00 to 10:00 am**

### Microscopy

*Session Chair*: **Eric L. Miller,** Tufts Univ.

9:00 am: **Inferring calcium dynamics from video microscopy**, Benjamin P. Olding, Patrick J. Wolfe, Harvard Univ. (United States) . . . . . [7246-42]

9:20 am: **To Be Announced**, Chrysanthe Preza, The Univ. of Memphis (United States) . . . . . [7246-53]

9:40 am: **Robust Point Spread Functions Estimation for 3D Wide-field Fluorescent Microscopes using PCA**, Muthuvel Arigovindan, Lin Shao, Peter Carlton, John W. Sedat, David A. Agard, Univ. of California, San Francisco (United States). . . . . [7246-24]

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

### SESSION 2

**Conv. Ctr. Room K: . . . . . .Mon. 10:30 am to 12:10 pm**

### Medical Imaging

*Session Chair*: **Jinyi Qi,** Univ. of California, Davis

10:30 am: **Direct reconstruction of dynamic PET parametric images with simplified reference tissue model**, Guobao Wang, Jinyi Qi, Univ. of California, Davis (United States). . . . . [7246-32]

10:50 am: **Maximizing Conjugate Norms of frames in DTI images**, Laurent Younes, Johns Hopkins Univ. (United States); Hsiao-Fang Chou, Johns Hopkins University (United States) . . . . . [7246-41]

11:10 am: **a new method for fMRI activation detection**, Jianing Wei, Thomas M. Talavage, Ilya Pollak, Purdue Univ. (United States). . . . . [7246-47]

11:30 am: **Divergence free interpolation of phase contrast MRI**, Kartik S. Sundareswaran, Georgia Institute of Technology (United States); David H. Frakes, Arizona State Univ. (United States); Oskar Skrinjar, Ajit P. Yoganathan, Georgia Institute of Technology (United States). . . . . [7246-46]

11:50 am: **Bayesian multiresolution method for local X-ray tomography**, Ville P. Kolehmainen, Univ. of Kuopio (Finland); Samuli Siltanen, Tampere Univ. of Technology (Finland); Kati Niinimäki, Univ. of Kuopio (Finland) . . . . . [7246-40]

Lunch Break . . . . . 12:10 to 1:40 pm

### SESSION 3

**Conv. Ctr. Room K:. . . . . .Mon. 1:40 to 2:20 pm**

### Inverse methods

*Session Chair*: **Ilya Pollak,** Purdue Univ.

1:40 pm: **Fast space-varying convolution and its application in stray light reduction**, Jianing Wei, Guangzhi Cao, Charles A. Bouman, Jan P. Allebach, Purdue Univ. (United States). . . . . [7246-31]

2:00 pm: **Joint Deconvolution and Imaging**, Hyrum Anderson, Maya R. Gupta, Univ. of Washington (United States) . . . . . [7246-45]

### SESSION 4

**Conv. Ctr. Room K:. . . . . .Mon. 2:20 to 4:30 pm**

### Sparse and Adaptive Signal Processing

*Session Chair*: **Luminita A. Vese,** Univ. of California, Los Angeles

2:20 pm: **Dictionaries for sparse representation and recovery of reflectances**, Steven Lansel, Manu Parmar, Brian A. Wandell, Stanford Univ. (United States). . . . . [7246-35]

2:40 pm: **l1 filtering**, Justin K. Romberg, Georgia Institute of Technology (United States) . . . . . [7246-30]

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

3:30 pm: **Sparsity regularization for image reconstruction with Poisson data**, Daniel J. Lingenfelter, Jeffrey A. Fessler, Zhong He, Univ. of Michigan Ann Arbor (United States). . . . . [7246-50]

3:50 pm: **Compressive Coded Aperture Imaging**, Roummel Marcia, Duke Univ. (United States); Zachary Harmany, Duke University (United States); Rebecca M. Willett, Duke Univ. (United States) . . . . . [7246-01]

4:10 pm: **Multi-Object Segmentation using Coupled Nonparametric Shape and Relative Pose Priors**, Gokhan M. Uzunbas, Octavian Soldea, Mujdat Cetin, Gozde Unal, Aytul Erçil, Sabanci Univ. (Turkey); Ahmet Ekin, Devrim Unay, Philips Research (Netherlands); Zeynep Firat, Yeditepe Univ. Hospital (Turkey) [7246-39]

### SESSION 5

**Conv. Ctr. Room K: . . . . . .Mon. 4:30 to 5:10 pm**

### Segmentation

*Session Chair*: **Mujdat Cetin,** Sabanci Univ. (Turkey)

4:30 pm: **Sobolev gradients and joint variational image segmentation, denoising, and deblurring**, Mi-Youn Jung, Univ. of California, Los Angeles (United States); Ginmo Chung, Hokkaido Univ. (Japan); Ganesh Sundaramoorthi, Luminita A. Vese, Alan L. Yuille, Univ. of California, Los Angeles (United States) . . . . . [7246-16]

4:50 pm: **Resolving occlusion and segmentation errors in multiple video object tracking**, Hsu-Yung Cheng, National Central Univ. (Taiwan); Jenq-Neng Hwang, Univ. of Washington (United States) . . . . . [7246-37]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

**Conv. Ctr. Room K: . . . . . .Tues. 10:30 to 11:00 am**

### Keynote Presentation

*Session Chair*: **Charles A. Bouman,** Purdue Univ.

10:30 am: **To Be Announced** *(Invited Paper)*, Malcom Slaney, Interval Research, Inc. (United States) . . . . . [7246-52]

## SESSION 6

**Conv. Ctr. Room K: . . . . . Tues. 11:00 am to 12:00 pm**

### Interpolation and Inpainting

*Session Chair*: **Keigo Hirakawa,** Harvard Univ.

11:00 am: **Iterative Demosaicking Accelerated: Theory and Fast Noniterative Implementations**, Yue M. Lu, Mina Karzand, Martin Vetterli, Swiss Federal Institute of Technology Lausanne (EPFL) (Switzerland) . . . . . [7246-03]

11:20 am: **Resolution and Interpolation Of Multichannel Long Wave Infrared Camera Data**, Andrew D. Portnoy, David J. Brady, Duke Univ. (United States) . . . . . [7246-22]

11:40 am: **Video Inpainting Algorithm Using Spatio-Temporal Consistency**, Sangheon Lee, Soon-Young Lee, Jun-Hee Heu, Seoul National Univ. (South Korea); Chang-Su Kim, Korea Univ. (South Korea); Sang Uk Lee, Seoul National Univ. (South Korea) . . . . . [7246-11]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

## SESSION 7

**Conv. Ctr. Room K: . . . . . Tues. 1:30 to 2:30 pm**

### Mathematical Imaging

*Session Chair*: **Josiane B. Zerubia,** INRIA Sophia Antipolis (France)

1:30 pm: **An application of a new quasi-linear polynomial solution method to image analysis**, Ji Zhang, Mireille Boutin, Purdue Univ. (United States)[7246-49]

1:50 pm: **Image zooming with contour stencils**, Pascal T. Getreuer, Univ. of California, Los Angeles (United States) . . . . . [7246-12]

2:10 pm: **Aspects of 3D Shape Reconstruction**, Peter F. Stiller, Texas A&M Univ. (United States); Gregory Arnold, Matthew A. Ferrara, Air Force Research Lab. (United States) . . . . . [7246-21]

## SESSION 8

**Conv. Ctr. Room K: . . . . . Tues. 2:30 to 4:10 pm**

### Statistical Imaging

*Session Chair*: **James Theiler,** Los Alamos National Lab.

2:30 pm: **Wavelet-based Poisson rate estimation using the Skellam distribution**, Keigo Hirakawa, Harvard Univ. (United States); Farhan A. Baqai, Sony Electronics, Inc. (United States); Patrick J. Wolfe, Harvard Univ. (United States) . . . . . [7246-43]

2:50 pm: **Dictionary-based probability density function estimation for high-resolution SAR data**, Vladimir A. Krylov, Lomonosov Moscow State Univ. (Russian Federation); Gabriele Moser, Sebastiano B. Serpico, Univ. of Genoa (Italy); Josiane Zerubia, INRIA Sophia Antipolis (France) . . . . . [7246-44]

3:10 pm: **Uncorrelated versus independent elliptically-contoured distributions for anomalous change detection in hyperspectral imagery**, James Theiler, Los Alamos National Lab. (United States) . . . . . [7246-36]

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

4:00 pm: **Photometry in UV astronomical images of extended sources in crowded field using deblended images in optical visible bands as bayesian priors**, Didier Vibert, Observatoire Astronomique de Marseille-Provence (France); Michel Zamojski, California Institute of Technology (United States); Antoine Llebaria, Observatoire Astronomique de Marseille-Provence (France); Stephane Arnouts, Canada France Hawaii Telescope (United States); Bruno Millard, Observatoire Astronomique de Marseille-Provence (France) . . . . . [7246-25]

4:20 pm: **Image denoising using locally learned dictionaries**, Priyam Chatterjee, Peyman Milanfar, Univ. of California, Santa Cruz (United States) . . . . . [7246-27]

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

## SESSION 9

**Conv. Ctr. Room K: . . . . . Tues. 4:40 to 5:20 pm**

### Registration

*Session Chair*: **Peyman Milanfar,** Univ. of California, Santa Cruz

4:40 pm: **Image registration for multi-exposed HDRI and motion deblurring**, Seok Lee, Ho-Cheon Wey, Seong-Deok Lee, Samsung Advanced Institute of Technology (South Korea) . . . . . [7246-09]

5:00 pm: **Comparison of subpixel image registration algorithms**, Robert Boye, Cynthia Nelson, Sandia National Labs. (United States) . . . . . [7246-26]

## SESSION 10

**Conv. Ctr. Room K: . . . . . Tues. 5:20 to 6:00 pm**

### Image Processing Applications

*Session Chair*: **Mireille Boutin,** Purdue Univ.

5:20 pm: **Three-Dimensional Electronic Unpacking of Packed Bags Using 3-D CT Images**, Samuel M. Song, Carl R. Crawford, Douglas P. Boyd, TeleSecurity Sciences, Inc. (United States) . . . . . [7246-19]

5:40 pm: **Personal dietary assessment using mobile devices,** Anand Mariappan, Marc Bosch Ruiz, Fengqing Zhu, Carol J. Boushey, David S. Ebert, Edward J. Delp III, Purdue Univ. (United States) . . . . . [7246-33]

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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 Paper Session.*

*Interactive Paper Sesison Authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Separation of limb and terminator on asteroids apparent contours**, Antoine Llebaria, Laurent Jorda, Olivier Groussin, Lab. d'Astrophysique de Marseille (France) . . . . . [7246-02]

**Iris tracking and recognition using visible images for accurate non-invasive human recognition**, Richard C. Tompkins, Old Dominion Univ. (United States) . . . . . [7246-14]

**Automated image processing and fusion for remote sensing applications**, Sakina Zabuawala, Nilanjan Ray, Hai Wei, Chaitanya Raju, Jacob Yadegar, UtopiaCompression Corp. (United States) . . . . . [7246-17]

**Support vector machine for automatic pain recognition from video sequences**, Md Maruf Monwar, Univ. of Calgary (Canada); Siamak Rezaei, Univ. of Northern British Columbia (Canada) . . . . . [7246-20]

## Courses of Related Interest

*Register for courses on-site!*

SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm

# Conference 7247

Wednesday-Thursday 21-22 January 2009 • Proceedings of SPIE Vol. 7247

# Document Recognition and Retrieval XVI

*Conference Chairs:* **Kathrin Berkner,** Ricoh Innovations, Inc.; **Laurence Likforman-Sulem,** TELECOM ParisTech (France)

*Program Committee:* **Gady Agam,** Illinois Institute of Technology; **Tim L. Andersen,** Boise State Univ.; **Apostolos Antonacopoulos,** Univ. of Salford (United Kingdom); **Elisa H. Barney-Smith,** Boise State Univ.; **Xiaoqing Ding,** Tsinghua Univ. (China); **David Scott Doermann,** Univ. of Maryland/College Park; **Jianying Hu,** IBM Thomas J. Watson Research Ctr.; **Matthew F. Hurst,** Intelliseek, Inc.; **Tapas Kanungo,** Yahoo! Inc.; **Daniel P. Lopresti,** Lehigh Univ.; **Lambert R. B. Schomaker,** Univ. of Groningen (Netherlands); **Xiaofan Lin,** Riya, Inc.; **Hiroshi Sako,** Hitachi, Ltd. (Japan); **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,** IDIAP Research Inst. (Switzerland); **Berrin Yanikoglu,** Sabanci Univ. (Turkey)

*Cosponsored by* RICOH

## Tuesday 20 January

**San Jose Convention Center,**
**Exhibit Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*Conference attendees are encouraged to attend the Interactive Paper 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 at 2:00 pm.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Improving semi-text-independent method of writer verification using difference vector**, Xin Li, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . [7247-27]

**Restoring warped document image through segmentation and full-page interpolation**, Yu Zhang, Changsong Liu, Xiaoqing Ding, Tsinghua Univ. (China) and State Key Lab for Information Science and Technology (China); Kongqiao Wang, Nokia Research Ctr. (China). . . . . [7247-28]

**Identification of forgeries in handwritten petitions for ballot propositions**, Sargur N. Srihari, Veshnu Ramakrishnan, Manavender Malgireddy, Gregory R. Ball, Univ. at Buffalo (United States) . . . . . [7247-29]

**Simultaneous segmentation and recognition of using linguistic concepts of vocabulary**, Mohamed Ben Halima, Ecole Nationale d'Ingénieurs de Sfax (Tunisia) . . . . . [7247-30]

**Comparison of Niblack inspired Binarization methods for ancient documents**, Khurram Khurshid, Imran Siddiqi, Univ. Paris Descartes (France); Claudie Faure, Ecole Nationale Supérieure des Télécommunications (France); Nicole Vincent, Univ. Paris Descartes (France) . . . . . [7247-31]

**Figure content analysis for improved biomedical article retrieval**, Daekeun You, Univ. at Buffalo (United States); Sameer K. Antani, National Library of Medicine (United States) . . . . . [7247-34]

**A semi-supervised learning method on grant-support zone classification for web-based medical articles**, Xiaoli Zhang, National Library of Medicine (United States) . . . . . [7247-35]

**Layout-Free Dewarping of Planar Document Images**, Masakazu Iwamura, Ryo Niwa, Akira Horimatsu, Koichi Kise, Osaka Prefecture Univ. (Japan); Seiichi Uchida, Kyushu Univ. (Japan); Shinichiro Omachi, Tohoku Univ. (Japan)[7247-36]

**Watermarking ancient documents based on wavelet packets**, Najoua Essoukri Ben Amara, Ecole Nationale d'Ingénieurs de Sousse (Tunisia) [7247-38]

6:00 pm: **Script identification of handwritten word images**, Anurag Bhardwaj, Venu Govindaraju, Univ. at Buffalo (United States). . . . . [7247-15]

## Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 1

**Conv. Ctr. Room A5: . . . . . Wed. 9:30 to 10:10 am**

#### Invited Presentation

9:30 am: **Pseudo-color enhanced x-ray fluorescence imaging of the Archimedes Palimpsest** *(Invited Paper)*, Uwe Bergmann, Stanford Linear Accelerator Ctr. (United States); Keith T. Knox, Boeing LTS, Inc. (United States) . . . . . [7247-01]

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

### SESSION 2

**Conv. Ctr. Room A5: . . . . . Wed. 10:40 to 11:40 am**

#### Segmentation

10:40 am: **Text-image alignment for historical handwritten documents**, Svitlana Zinger, John Nerbonne, Lambert Schomaker, Univ. of Groningen (Netherlands) . . . . . [7247-02]

11:00 am: **Document boundary determination usinglinebreak structural and lexical analysis**, Kazem Taghva, Univ. of Nevada, Las Vegas (United States) . . . . . [7247-04]

11:20 am: **Segmentation of continuous document flow by a modified backward-forward algorithm**, Abdel Belaid, Thomas Meilender, LORIA France). . . . . [7247-05]

Lunch/Exhibition Break . . . . . 11:40 am to 1:40 pm

### SESSION 3

**Conv. Ctr. Room A5: . . . . . Wed. 1:40 to 3:00 pm**

#### Retrieval and Text Categorization

1:40 pm: **Retrieval of historical documents by word spotting**, Ergina Kavallieratou, Nikoleta Doulgeri, Univ. of the Aegean (Greece) . . . . . [7247-06]

2:00 pm: **Enriching a document collection by integrating information extraction and PDF annotation**, Brett Powley, Robert Dale, Ilya Anisimoff, Macquarie Univ. (Australia) . . . . . [7247-07]

2:20 pm: **Locating and parsing references in HTML medical articles**, Jie Zou, Daniel X. Le, George R. Thoma, National Library of Medicine (United States) . . . . . [7247-08]

2:40 pm: **On-line handwritten text categorization**, Sebastian Peña Saldarriaga, Christian Viard-Gaudin, Emmanuel Morin, Univ. de Nantes (France) . . . [7247-09]

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

### SESSION 4

**Conv. Ctr. Room A5: . . . . . .Wed. 3:30 to 4:30 pm**

**Recognition I**

3:30 pm: **Improvement of Arabic Handwriting Recognition Systems - Combination and/or Reject?**, Haikal El Abed, Volker Märgner, Technische Univ. Braunschweig (Germany) . . . . . [7247-10]

3:50 pm: **A Robust Model for On-line Handwritten Japanese Text Recognition**, Bilan Zhu, Tokyo Univ. of Agriculture and Technology (Japan); Xiang-Dong Zhou, Cheng-Lin Liu, Institute of Automation (China); Masaki Nakagawa, Tokyo Univ. of Agriculture and Technology (Japan) . . . . . [7247-11]

4:10 pm: **Online computation of similarity between handwritten characters**, Oleg D. Golubitsky, Stephen M. Watt, The Univ. of Western Ontario (Canada) . . . . . [7247-12]

## Thursday 22 January

### SESSION 5

**Conv. Ctr. Room A5: . . . . . .Thurs. 8:30 to 9:10 am**

**Invited Presentation**

8:30 am: **Advanced topics in character recongition and document analysis: research work in Intelligent Image & Document Research Lab** *(Invited Paper)*, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . [7247-13]

### SESSION 6

**Conv. Ctr. Room A5: . . . . . .Thurs. 9:10 to 10:10 am**

**Writer or Script Identification**

9:10 am: **Comparison of statistical models for writer verification**, Sargur N. Srihari, Gregory R. Ball, Univ. at Buffalo (United States) . . . . . [7247-14]

9:30 am: **Online writer identification using alphabetic information clustering**, Guoxian Tan, Nanyang Technological Univ. (Singapore); Christian Viard-Gaudin, Univ. de Nantes (France); Alex C. Kot, Nanyang Technological Univ. (Singapore) . . . . . [7247-16]

9:50 am: **A Proposal for a Camera-based Ballot Counting Device**, George Nagy, Rensselaer Polytechnic Institute (United States); Elisa H. Barney-Smith, Boise State Univ. (United States); Daniel P. Lopresti, Lehigh Univ. (United States) . . . . . [7247-39]

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

### SESSION 7

**Conv. Ctr. Room A5: . . . . . Thurs. 10:40 am to 12:00 pm**

**Recognition II**

10:40 am: **The safe use of synthetic data in classification**, Jean E. Nonnemaker, Henry S. Baird, Lehigh Univ. (United States) . . . . . [7247-17]

11:00 am: **Combination of dynamic Bayesian network classifiers for the recognition of degraded characters**, Laurence Likforman-Sulem, Marc Sigelle, TELECOM ParisTech (France). . . . . [7247-18]

11:20 am: **Character recognition in the presence of occluding clutter**, Knut T. Fosseide, Lars Aurdal, Lumex AS (Norway) . . . . . [7247-19]

11:40 am: **Multi-font printed Mongolian document recognition system**, Liangrui Peng, Changsong Liu, Xiaoqing Ding, Hua Wang, Jianming Jin, Tsinghua Univ. (China) . . . . . [7247-20]

Lunch Break . . . . . 12:00 to 1:40 pm

### SESSION 8

**Conv. Ctr. Room A5: . . . . . .Thurs. 1:40 to 3:00 pm**

**Segmentation and Restoration**

1:40 pm: **Resolution independent skew and orientation detection**, Joost Van Beusekom, Faisal Shafait, Thomas M. Breuel, DFKI GmbH (Germany) . [7247-21]

2:00 pm: **Text line extraction in free-style document**, Xiaolu Shen, Changsong Liu, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . [7247-22]

2:20 pm: **Simultaneous detection of vertical and horizontal text lines based on perceptual organization**, Claudie Faure, TELECOM ParisTech (France) and Univ. Paris Descartes (France); Nicole Vincent, Univ. Paris Descartes (France) . . . . . [7247-23]

2:40 pm: **Efficient shape-LUT algorithm for document image restoration**, Tayo Obafemi-Ajayi, Gady Agam, Ophir Frieder, Illinois Institute of Technology (United States). . . . . [7247-24]

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

### SESSION 9

**Conv. Ctr. Room A5: . . . . . .Thurs. 3:30 to 4:10 pm**

**Image Processing**

3:30 pm: **Camera-based document image mosaicing using LLAH**, Tomohiro Nakai, Koichi Kise, Masakazu Iwamura, Osaka Prefecture Univ. (Japan)[7247-25]

3:50 pm: **Mark detection from scanned ballots,** Elisa H. Barney-Smith, Boise State Univ. (United States); George Nagy, Rensselaer Polytechnic Institute (United States); Daniel P. Lopresti, Lehigh Univ. (United States) . . . . . [7247-26]

**Conv. Ctr. Room A5: . . . . . .Thurs. 4:10 to 5:30 pm**

**Panel Discussion**

## Courses of Related Interest

*Register for courses on-site!*

SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm

# Conference 7248

Wednesday-Thursday 21-22 January 2009 • Proceedings of SPIE Vol. 7248

# Wavelet Applications in Industrial Processing VI

*Conference Chairs:* **Frederic Truchetet,** Univ. de Bourgogne (France); **Olivier Laligant,** Univ. de Bourgogne (France)

*Program Committee:* **Patrice Abry,** École Normale Supérieure de Lyon (France); **Jean-Pierre Antoine,** Univ. Catholique de Louvain (Belgium); **Radu V. Balan,** Siemens Corporate Research; **Atilla M. Baskurt,** Univ. de Claude Bernard Lyon I (France); **Amel Benazza-Benyahia,** Ecole Supérieure des Communications de Tunis (Tunisia); **Albert Bijaoui,** Observatoire de la Côte d'Azur (France); **Laurent C. Duval,** Institut Français du Pétrole (France); **Seiji Hata,** Kagawa Univ. (Japan); **William S. Hortos,** Associates in Communication Engineering Research and Technology; **Jacques Lewalle,** Syracuse Univ.; **Wilfried R. Philips,** Univ. Gent (Belgium); **Alexandra Pizurica,** Univ. Gent (Belgium); **Guoping Qiu,** The Univ. of Nottingham (United Kingdom); **Hamed Sari-Sarraf,** Texas Tech Univ.; **Peter Schelkens,** Vrije Univ. Brussel (Belgium); **Paul Scheunders,** Univ. Antwerpen (Belgium); **Ivan W. Selesnick,** Polytechnic Univ.; **Kenneth W. Tobin, Jr.,** Oak Ridge National Lab.; **Günther K. G. Wernicke,** Humboldt-Univ. zu Berlin (Germany); **Gerald Zauner,** Fachhochschule Wels (Austria)

## Wednesday 21 January

**Plenary Presentation**

**Merriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 1

**Conv. Ctr. Room C1: . . . . . .Wed. 9:30 to 10:10 am**

**The JPEG 2000 Family of Standards**

*Session Chair*: **Frédéric Truchetet,** Univ. de Bourgogne (France)

9:30 am: **The JPEG 2000 family of standards** *(Invited Paper)*, Peter Schelkens, Vrije Univ. Brussel (Belgium) . . . . . [7248-01]

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

### SESSION 2

**Conv. Ctr. Room C1: . . . . . Wed. 10:40 am to 12:00 pm**

**Tools for Signal and Image Analysis**

*Session Chair*: **Eva Wesfreid,** Ecole Normale Supérieure de Cachan (France)

10:40 am: **Multiridgelets for texture analysis**, Hong-Jun Yoon, Ching-Chung Li, Univ. of Pittsburgh (United States) . . . . . [7248-02]

11:00 am: **Kolmogorov superposition theorem and its application to multivariate function decomposition**, Pierre-Emmanuel Leni, Yohan D. Fougerolle, Frédéric Truchetet, Univ. de Bourgogne (France) . . . . . [7248-03]

11:20 am: **Image denoising in real-time system aided by simulation tools**, Jintao Wang, Communication Univ. of China (China) . . . . . [7248-04]

11:40 am: **Empirical mode decomposition for multimodal range imaging**, Yohan D. Fougerolle, Marie Pelletier, Frédéric Truchetet, Univ. de Bourgogne (France) . . . . . [7248-05]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

### SESSION 3

**Conv. Ctr. Room C1: . . . . . Wed. 1:30 to 2:50 pm**

**Compression**

*Session Chair*: **Peter Schelkens,** Vrije Univ. Brussel (Belgium)

1:30 pm: **Semi-regular 3D mesh progressive compression and transmission based on an adaptive wavelet decomposition**, Céline Roudet, Florent Dupont, Atilla Baskurt, Univ. de Claude Bernard Lyon I (France) . . . . . [7248-06]

1:50 pm: **A novel efficient image compression system based on independent component analysis**, Zafar Shahid, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); Florent Dupont, Atilla M. Baskurt, Univ. de Claude Bernard Lyon I (France) . . . . . [7248-07]

2:10 pm: **Locally adaptive passive error concealment for wavelet coded video**, Joost Rombaut, Aleksandra Pizurica, Wilfried R. Philips, Univ. Gent (Belgium) . . . . . [7248-09]

2:30 pm: **Estimation of interband and intraband statistical dependencies in wavelet-based decomposition of meshes**, Shahid M. Satti, Leon Denis, Adrian Munteanu, Peter Schelkens, Jan P. H. Cornelis, Vrije Univ. Brussel (Belgium) . . . . . [7248-10]

Coffee Break . . . . . 2:50 to 3:40 pm

### SESSION 4

**Conv. Ctr. Room C1: . . . . . .Wed. 3:40 to 5:00 pm**

**Physics-Based Models and Applications I**

*Session Chair*: **Atilla M. Baskurt,** Univ. de Claude Bernard Lyon I (France)

3:40 pm: **A colony image-segmentation algorithm on wavelet theory**, Weixing Wang, Hubei Univ. of Technology (China). . . . . [7248-11]

4:00 pm: **An image fusion method based on multiscale edge detection for rock fractures**, Jiangyan Xu, Univ. of Electronic Science and Technology of China (China) . . . . . [7248-12]

4:20 pm: **Wavelet-based subsurface defect characterization in pulsed thermography for nondestructive evaluation**, Gerald Zauner, Guenther Mayr, Bernhard Dietermayr, Guenther Hendorfer, FH OÖ Forschungs & Entwicklungs GmbH (Austria) . . . . . [7248-13]

4:40 pm: **Curvelets-based primitives for handwriting images analysis: application to document images retrieval and clustering**, Guillaume Joutel, Véronique Eglin, Hubert Emptoz, Institut National des Sciences Appliquées de Lyon (France). . . . . [7248-14]

## Thursday 22 January

### SESSION 5

**Conv. Ctr. Room C1: . . . . . Thurs. 8:30 to 9:30 am**

**Physics-Based Models and Applications II**

*Session Chair*: **Atilla M. Baskurt,** Univ. de Claude Bernard Lyon I (France)

8:30 am: **Image blur estimation based on the average cone of ratio in the wavelet domain**, Ljiljana Ilic, Aleksandra Pizurica, Ewout Vansteenkiste, Wilfried R. Philips, Univ. Gent (Belgium) . . . . . [7248-15]

8:50 am: **New Image Quality Measure Based on Wavelets**, Emil Dumic, Sonja Grgic, Mislav Grgic, Univ. of Zagreb (Croatia). . . . . [7248-16]

9:10 am: **Power law scaling behavior of physiological time series in marathon races using Wavelet Leaders and Detrended Fluctuation Analysis**, Eva Wesfreid, Ecole Normale Supérieure de Cachan (France) and Univ. du Littoral (France); Veronique Billat, Univ. d'Evry Val d'Essonne (France) . [7248-17]

## SESSION 6

**Conv. Ctr. Room C1: . . . . . Thurs. 9:30 am to 12:00 pm**

### Image Representation and Watermarking

*Session Chair*: **Gerald Zauner,** FH OÖ Forschungs & Entwicklungs GmbH (Austria)

9:30 am: **From watermarking to in-band enrichment: future trends** *(Invited Paper)*, Mihai P. Mitrea, Institut National des Télécommunications (France) . . . . . [7248-28]

9:50 am: **Locally adaptive complex wavelet-based demosaicing for color filter array images**, Jan Aelterman, Bart Goossens, Hiep Q. Luong, Aleksandra Pizurica, Wilfried R. Philips, Univ. Gent (Belgium). . . . . [7248-20]

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

10:40 am: **Embedding Distortion Modeling for Wavelet based Watermarking Schemes**, Deepayan Bhowmik, Charith Abhayaratne, The Univ. of Sheffield (United Kingdom). . . . . [7248-21]

11:00 am: **Image segmentation on cell-center sampled quadtree and octree grids**, Byungmoon Kim, Consultant (United States); Panagiotis Tsiotras, Georgia Institute of Technology (United States) . . . . . [7248-22]

11:20 am: **A framework for evaluating wavelet-based watermarking for scalable coded digital item adaptation attacks** *(Invited Paper)*, Deepayan Bhowmik, Charith K. Abhayaratne, The Univ. of Sheffield (United Kingdom) . . . . . [7248-23]

11:40 pm: **Multipurpose Watermarking Scheme using Essentially Non-Oscillatory Point-Value Decomposition**, Gaurav Bhatnagar, Sankalp Arrabolu, Raman Balasubramanian, Indian Institute of Technology Roorkee (India); K. Swaminathan, Indian Institute of Technology Madras (India) . . . . . [7248-18]

## Courses of Related Interest

*Register for courses on-site!*

SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm

# Conference 7249

Tuesday-Thursday 20-22 January 2009 • Proceedings of SPIE Vol. 7249

# Sensors, Cameras, and Systems for Industrial/Scientific Applications X

*Conference Chairs:* **Erik Bodegom,** Portland State Univ.; **Valérie Nguyen,** Commissariat à l'Energie Atomique (France)

*Program Committee:* **Morley M. Blouke,** Ball Aerospace & Technologies Corp.; **Terrence S. Lomheim,** The Aerospace Corp.; **Kevin J. Matherson,** Hewlett-Packard Co.; **Gloria G. Putnam,** Eastman Kodak Co.; **Alice L. Reinheimer,** e2v; **Nobukazu Teranishi,** Matsushita Electric Industrial Co., Ltd. (Japan); **Bruce True,** Intevac, Inc.; **Penny G. Warren,** Ball Aerospace & Technologies Corp.

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

### SESSION 1

**Conv. Ctr. Room C3: . . . . . Tues. 2:00 to 4:50 pm**

**Color and Multispectral Techniques**

*Session Chair*: **Erik Bodegom,** Portland State Univ.

2:00 pm: **MonoColor CMOS sensor**, Ynjiun P. Wang, Honeywell Imaging and Mobility (United States) . . . . . [7249-01]

2:20 pm: **The Implementation and Spectrum Response Analysis of Multi-Finger Photogate APS pixels**, Jenny Leung, Michelle L. La Haye, Glenn H. Chapman, Simon Fraser Univ. (Canada) . . . . . [7249-03]

2:40 pm: **Nanoplasmonic filters for image sensors**, Stephane Getin, Yohan Désières, Catherine Pellé, Olivier Lartigue, Ludovic Poupinet, Laurent Frey, Commissariat à l'Energie Atomique (France) . . . . . [7249-04]

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

3:30 pm: **Thin Color and Stop-InfraRed Metal-dielectric Filters for CMOS Image Sensors**, Gilles Grand, Catherine Pellé, Laurent Frey, Norbert Moussy, Jacques Raby, Commissariat à l'Energie Atomique (France) . . . . . [7249-05]

3:50 pm: **Color and hyperspectral imaging sensors applied to manufactured stone products**, Giuseppe Bonifazi, Laura D'Aniello, Claudio Durante, Silvia Serranti, Univ. degli Studi di Roma, La Sapienza (Italy) . . . . . [7249-06]

4:10 pm: **Hyperspectral-sensing techniques applied to olive-husk characterization**, Giuseppe Bonifazi, Laura D'Aniello, Aldo Gargiulo, Silvia Serranti, Univ. degli Studi di Roma, La Sapienza (Italy) . . . . . [7249-07]

4:30 pm: **Camera system for multispectral imaging of documents,** William A. Christens-Barry, Equipoise Imaging, LLC (United States); Kenneth Boydston, MegaVision, Inc. (United States); Fenella G. France, The Library of Congress (United States); Keith T. Knox, Boeing LTS, Inc. (United States); Roger L. Easton, Jr., Rochester Institute of Technology (United States); Michael B. Toth, R B Toth Associates (United States) . . . . . [7249-09]

**Conv. Ctr. Exhibition Hall: . . . . . Tues. 6:00 to 8:30 pm**

**Interactive paper and Symposium Demonstration Session**

*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.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Non-contact finger vein acquisition system using NIR laser**, JiMan Kim, Hyoun-Joong Kong, Sangyun Park, SeungWoo Noh, Seung-Rae Lee, Taejeong Kim, Seoul National Univ. (Korea, Republic of); Hee Chan Kim, Seoul National Univ. (Korea, Republic of) and Seoul National Univ. College of Medicine (Korea, Republic of) . . . . . [7249-35]

**A Static Multiplex Fabry-Perot Spectrometer**, Nan Zheng, Renu John, Nathan A. Hagen, David J. Brady, Duke Univ. (United States) . . . . . [7249-37]

**The 4K×4K CCD camera for astronomical application**, Yuanyuan Shang, Capital Normal Univ. (China); Qian Song D.D.S., National Astronomical Observatories (China); Yingfei Liu, Nokia Research Ctr. (China). . . . . [7249-38]

**The design and evaluation of large dynamic range CMOS camera for solar observation**, Yuanyuan Shang, Yong Guan, Capital Normal Univ. (China); Dan Li, National Astronomical Observatories (China) . . . . . [7249-39]

## Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 2

**Conv. Ctr. Room C3: . . . . . Wed. 9:30 to 10:50 am**

**Sensors I**

*Session Chair*: **Valerie Nguyen,** Commissariat à l'Energie Atomique (France)

9:30 am: **An ultra fast 100 ps, 100µm 3D pixel imager**, Alex Kluge, Pierre Jarron, Jan Kaplon, Petra Riedler, Teemu S. Tiuraniemi, Fadmar Osmic, CERN (Switzerland); Giulio Dellacasa, Gianni Mazza, Angelo Rivetti, Sorin Martoiu, Angelo C. Ramusino, Massimiliano Fiorini, Istituto Nazionale di Fisica Nucleare (Italy); Elena Albarran Martin, CERN (Switzerland) . . . . . [7249-10]

9:50 am: **Recent advances in orthogonal transfer arrays for Pan-STARRS**, Michael Cooper, Barry E. Burke, MIT Lincoln Lab. (United States); John Tonry, Univ. of Hawai'i (United States); Douglas J. Young, Andrew H. Loomis, MIT Lincoln Lab. (United States); Peter M. Onaka, Univ. of Hawai'i (United States) . . . . . [7249-11]

10:10 am: **Packaging and characterization of orthogonal transfer array CCDs**, Michael P. Lesser, David B. Ouellette, Grzegorz Zareba, The Univ. of Arizona/Steward Observatory (United States); George H. Jacoby, Gary P. Muller, David G. Sawyer, WIYN Observatory (United States); Richard A. Bredthauer, Kasey L. Boggs, Semiconductor Technology Associates Inc. (United States) . . . . . [7249-12]

10:30 am: **New 5.5 µm Interline Transfer CCD Platform for Applied Imaging Markets**, James A. DiBella, Sr., Douglas A. Carpenter, Robert Kaser, Stephen L. Kosman, Xueyuan Liu, John P. McCarten, Eric J. Meisenzahl, Thomas Pian, Christopher Parks, David N. Nichols, Eastman Kodak Co. (United States) . . . . . [7249-13]

Coffee Break . . . . . 10:50 to 11:10 am

### SESSION 3

**Conv. Ctr. Room C3: . . . . . Wed. 11:10 am to 12:30 pm**

**Sensors II**

*Session Chair*: **Morley M. Blouke,** Ball Aerospace & Technologies Corp.

11:10 am: **A Global Electronic Shutter Pixel Using Pinned Diodes Fabricated in Standard CMOS Image Sensor Technology**, Keita Yasutomi, Shizuoka Univ. (Japan); Toshihiro Tamura, Photron Ltd. (Japan); Masanori Furuta, Toshiba Corp. (Japan); Shinya Itoh, Shoji Kawahito, Shizuoka Univ. (Japan) . . . . . [7249-14]

11:30 am: **Low Gr-Gb sensitivity imbalance 3.2M CMOS-image sensor with 2.2-µm pixel**, Nagataka Tanaka, Junji Naruse, Hirofumi Yamashita, Ikuko Inoue, Makoto Monoi, Toshiba Corp. (Japan) . . . . . [7249-15]

11:50 am: **16k pixel digital line-scan sensor with 12bit resolution and 40kS/second**, Martin Wäny, Paulo Franco, Stephan Voltz, AWAIBA Lda. (Portugal) . . . . . [7249-16]

12:10 pm: **High-speed and high-dynamic range difference imaging based on the near-sensor image processing concept**, Anders Astrom, Combitech Systems AB (Sweden); Robert Forchheimer, Linkoping Univ. (Sweden) [7249-17]

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

### SESSION 4

**Conv. Ctr. Room C3: . . . . . Wed. 2:00 to 3:20 pm**

**Novel Imaging Devices and Applications I**

*Session Chair*: **Alice L. Reinheimer,** e2v

2:00 pm: **Experimental color video capturing equipment with three 33-megapixel CMOS image sensors**, Takayuki Yamashita, NHK Science & Technical Research Labs. (Japan); Steven Huang, Forza Silicon Corporation (United States); Ryohei Funatsu, NHK Science & Technical Research Labs. (Japan); Barmak Mansoorian, Forza Silicon Corporation (United States); Kohji Mitani, Yuji Nojiri, NHK Science & Technical Research Labs. (Japan) . . [7249-18]

2:20 pm: **A single-layer CCD image sensor with wide-gap electrode and gradual potential channel**, Makoto Monoi, Toshiba Corp. (Japan); Syu Sasaki, Kumiko Dobashi, Junya Iwai, Hirokazu Sekine, Iwate Toshiba Electronics Co., Ltd. (Japan); masayuki ooki, Seiichi Mashiko, Hiroyuki Saito, Toshiba Microelectronics Corp. (Japan); Ken Tomita, Yasushi Itabashi, Toshiba Corp. (Japan) . . . . . [7249-19]

2:40 pm: **Low dark current, back-illuminated charge coupled devices**, Richard C. Westhoff, Barry E. Burke, H. R. Clark, Andrew H. Loomis, Douglas J. Young, James A. Gregory, Robert K. Reich, MIT Lincoln Lab. (United States) . . . . . [7249-40]

3:00 pm: **A CMOS Active Pixel Sensor for Optical Communication**, Md. Shakowat Zaman Sarker, Shizuoka Univ. (Japan); Isamu Takai, Michinori Andoh, Toyota central R&D Labs., Inc. (Japan); Keita Yasutomi, Shinya Itoh, Shoji Kawahito, Shizuoka University (Japan) . . . . . [7249-21]

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

### SESSION 5

**Conv. Ctr. Room C3: . . . . . Wed. 4:00 to 5:40 pm**

**Modeling**

*Session Chair*: **Morley M. Blouke,** Ball Aerospace & Technologies Corp.

4:00 pm: **Residual bulk image characterization and management in CCD image sensors**, Richard D. Crisp, Tessera, Inc. (United States) . . . . . [7249-22]

4:20 pm: **Characterization and system modeling of M-pixel CMOS arrays part II**, Curtis Tesdahl, Prateek Jain, David A. Dorn, Pelco (United States) . . . . . [7249-23]

4:40 pm: **Dark current behavior in DSLR cameras**, Justin C. Dunlap, Portland State Univ. (United States); Oleg Sostin, Portland State (United States); Ralf Widenhorn, Erik Bodegom, Portland State Univ. (United States) . . . . . [7249-24]

5:00 pm: **Optimization of Photodetector Thickness in Vertically-Integrated Image Sensors**, Orit Skorka, Dan Sirbu, Dileepan Joseph, Univ. of Alberta (Canada) . . . . . [7249-25]

5:20 pm: **Computational modeling of CMOS image sensor pixels: from module lens to photoelectron**, Jeff Mackey, Victor A. Lenchenkov, William Gazeley, Xiaofeng Fan, Ulrich C. Boettiger, Gennadiy A. Agranov, Aptina Imaging (United States) . . . . . [7249-26]

## Thursday 22 January

### SESSION 6

**Conv. Ctr. Room C3:. . . . . .Thurs. 8:20 to 10:00 am**

**Novel Imaging Devices and Applications II**

*Session Chair*: **Valerie Nguyen,** Commissariat à l'Energie Atomique (France)

8:20 am: **Superconducting single photon detectors for ultrasensitive visible and IR detection**, Roch Espiau de Lamaestre, Laurent Frey, Christophe Constancias, Laurent Maingault, Paul Cavalier, Jean-Claude Villegier, Commissariat à l'Energie Atomique (France); Jean-Philippe Poizat, Univ. Joseph Fourier (France) . . . . . [7249-27]

8:40 am: **High quantum efficiency, back-illuminated, crystallographically etched, silicon-on-sapphire avalanche photodiode with very wide dynamic range, for manufacturable high resolution imaging arrays**, Alvin G. Stern, Daniel C. Cole, Boston Univ. (United States) . . . . . [7249-28]

9:00 am: **A day and night MOS imager spectrally adjusted for a wide range of color temperatures**, Shinzo Koyama, Masahiro Kasano, Keisuke Tanaka, Kazuo Fujiwara, Toshinobu Matsuno, Yutaka Hirose, Yasuhiro Shimada, Panasonic Corporation (Japan). . . . . [7249-29]

9:20 am: **High-speed sequential image acquisition using a CMOS image sensor with a multi-lens optical system and its application for three-dimensional measurement**, Daisuke Miyazaki, Hiroki Shimizu, Osaka City Univ. (Japan); Yoshizumi Nakao, Takashi Toyoda, Yasuo Masaki, Funai Electric Co., Ltd. (Japan) . . . . . [7249-30]

9:40 am: **Fast Single-Photon Imager acquires 1024 pixels at 100 kframe/s**, Fabrizio Guerrieri, Politecnico di Milano (Italy); Simone Tisa, Micro Photon Devices (Italy) and Politecnico di Milano (Italy); Franco Zappa, Politecnico di Milano (Italy) . . . . . [7249-31]

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

### SESSION 7

**Conv. Ctr. Room C3:. . . . . .Thurs. 10:30 to 11:30 am**

**Applications**

*Session Chair*: **Erik Bodegom,** Portland State Univ.

10:30 am: **Minimal form factor digital-image sensor for endoscopic applications**, Martin Wäny, Stephan Voltz, Fabio Gaspar, Lei Chen, AWAIBA Lda. (Portugal) . . . . . [7249-32]

10:50 am: **Self-calibrating optical object tracking using Wii remotes**, Ian F. Rickard, James E. Davis, Univ. of California, Santa Cruz (United States)[7249-33]

11:10 am: **Spectroscopy using the Hadamard Transform**, Dale J. Fixsen, Matthew A. Greenhouse, NASA Goddard Space Flight Ctr. (United States); John A. MacKenty, Space Telescope Institute (United States) . . . . . [7249-34]

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC504 Introduction to CCD and CMOS Imaging Sensors and Applications (Janesick) Monday, 8:30 am to 5:30 pm |
| SC807 Digital Camera and Scanner Performance Evaluation: Science, Standards and Software (Burns, Williams) Sunday, 8:30 am to 5:30 pm |
| SC916 Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick) Tuesday, 8:30 am to 5:30 pm |

# Conference 7250

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7250

# Digital Photography V

*Conference Chairs:* **Brian G. Rodricks,** Fairchild Imaging; **Sabine E. Süsstrunk,** École Polytechnique Fédérale de Lausanne (Switzerland)

*Program Committee:* **Donald J. Baxter,** STMicroelectronics (United Kingdom); **Peter B. Catrysse,** Stanford Univ.; **Ted J. Cooper,** Foveon, Inc.; **Jeffrey M. DiCarlo,** Hewlett-Packard Labs.; **Edward R. Dowski, Jr.,** Omnivision CDM Optics, Inc.; **Joyce E. Farrell,** Stanford Univ.; **Boyd A. Fowler,** Fairchild Imaging; **Frederic Guichard,** DxO Labs. (France); **Francisco Imai,** Samsung Information Systems America, Inc.; **Michael A. Kriss,** Consultant; **Jingqiang Dylan Li,** LifeSize Communications, Inc.; **Russel A. Martin,** Foveon, Inc.; **Kevin J. Matherson,** Hewlett-Packard Co.; **Seishi Ohmori,** Nikon Corp. (Japan); **Gloria G. Putnam,** Eastman Kodak Co.; **John R. Reinert-Nash,** Lifetouch, Inc.; **Todd Sachs,** Aptina Imaging; **Nitin Sampat,** Rochester Institute of Technology; **Dietmar Wueller,** Image Engineering (Germany); **Feng Xiao,** Fairchild Imaging

## Monday 19 January

**Conv. Ctr. Room A4/A5: . . . . . Mon. 9:00 to 9:10 am**

### Opening Remarks

*Session Chairs*: **Brian G. Rodricks,** Fairchild Imaging; **Sabine E. Süsstrunk,** Ecole Polytechnique Fédérale de Lausanne (Switzerland)

### SESSION 1

**Conv. Ctr. Room A4/A5: . . . . . Mon. 9:10 to 9:50 am**

### Computational Photography

*Session Chairs*: **Brian G. Rodricks,** Fairchild Imaging; **Sabine E. Süsstrunk,** Ecole Polytechnique Fédérale de Lausanne (Switzerland)

9:10 am: **Light field photography and microscopy** *(Invited Paper, Presentation Only)*, Marc S. Levoy, Stanford Univ. (United States) . . . . . [7250-46]

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

### SESSION 2

**Conv. Ctr. Room A4/A5: . . . . . Mon. 10:40 to 11:40 am**

### Sensor Design

*Session Chair*: **Peter B. Catrysse,** Stanford Univ.

10:40 am: **Very-large-area CCD image sensors: concept and cost-effective research**, Erik W. Bogaart, Inge M. Peters, Agnes C. Kleimann, Erik-Jan P. Manoury, Wilco Klaassens, Walter de Laat, DALSA Corp. (Netherlands); Cees Draijer, Raymond Frost, DALSA Corp. (Canada); Jan T. Bosiers, DALSA Corp. (Netherlands) . . . . . [7250-39]

11:00 am: **Decoupling light collection efficiency and color crosstalk from the Quantum Efficiency Spectrum for the CMOS image sensor pixel development**, Yang Wu, Philip J. Cizdziel, Howard E. Rhodes, OmniVision Technologies, Inc. (United States). . . . . [7250-11]

11:20 am: **Microlens performance limits in sub-2um pixel CMOS image sensors**, Yijie Huo, Christian C. Fesenmaier, Peter B. Catrysse, Stanford Univ. (United States). . . . . [7250-35]

Lunch Break . . . . . 11:40 to 2:10 pm

### SESSION 3

**Conv. Ctr. Room A4/A5: . . . . . Mon. 2:10 to 3:30 pm**

### Color Sensing

*Session Chair*: **Donald J. Baxter,** STMicroelectronics Ltd. (United Kingdom)

2:10 pm: **Sensor information capacity and spectral sensitivities**, Frédéric Cao, Frédéric Guichard, Hervé Hornung, DxO Labs. (France) . . . . . [7250-23]

2:30 pm: **2PFC CMOS Image Sensors: Better Image Quality at Low Cost**, Douglas J. Tweet, Jong-Jan Lee, Jon M. Speigle, Sharp Labs. of America, Inc. (United States); Daniel Tamburrino, Sharp Labs. of America, Inc. (United States) and Ecole Polytechnique Federale de Lausanne (Switzerland). . . . . [7250-42]

2:50 pm: **Interleaved Imaging: An Imaging System Design Inspired by Rod-Cone Vision**, Manu Parmar, Brian A. Wandell, Stanford Univ. (United States) . . . . . [7250-32]

3:10 pm: **Optimal color filter array design: quantitative conditions and efficient search procedures**, Yue M. Lu, Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7250-40]

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

### SESSION 4

**Conv. Ctr. Room A4/A5: . . . . . Mon. 4:00 to 5:20 pm**

### Color Processing

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

4:00 pm: **New architectures of an image-processing pipeline based on nonlinear image-decomposition**, Takahiro Saito, Daisuke Yamada, Haruya Aizawa, Takashi Komatsu, Kanagawa Univ. (Japan) . . . . . [7250-01]

4:20 pm: **An image-noise filter with emphasis on low-frequency chrominance noise**, Radu V. Gheorghe, Sergiu R. Goma, Milivoje Aleksic, Advanced Micro Devices, Inc. (Canada). . . . . [7250-13]

4:40 pm: **False-color removal on the YCC color space**, Mirko Guarnera, Valeria Tomaselli, Giuseppe Messina, STMicroelectronics (Italy) . . . . . [7250-19]

5:00 pm: **whitebalPR Using the Dichromatic Reflection Model**, Matthias Sajjaa, Gregor Fischer, Univ. of Applied Sciences Köln (Germany) . . . . [7250-04]

## Tuesday 20 January

### Plenary Presentation

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 5

**Conv. Ctr. Room A4/A5: . . . . . Tues. 10:30 am to 12:10 pm**

### System Analysis

*Session Chair*: **Francisco Hideki Imai,** Samsung Information Systems America, Inc.

10:30 am: **Illuminant estimation and detection using near-infrared**, Clement Fredembach, Sabine E. Susstrunk, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7250-33]

10:50 am: **Naturalness classification of images into DCT domain**, Sebastiano Battiato, Giovanni M. Farinella, Giovanni Gallo, Enrico Messina, Univ. degli Studi di Catania (Italy). . . . . [7250-09]

11:10 am: **Effects of imaging lens f-number on sub-2 µm CMOS image sensor pixel performance**, Christian C. Fesenmaier, Peter B. Catrysse, Stanford Univ. (United States) . . . . . [7250-36]

11:30 am: **Measuring texture sharpness of a digital camera**, Frédéric Cao, Frédéric Guichard, Hervé Hornung, DxO Labs. (France) . . . . . [7250-21]

11:50 am: **Interaction of image noise, spatial resolution, and texture preservation in digital image processing**, Uwe Artmann, Dietmar Wueller, Image Engineering Dietmar Wüller (Germany) . . . . . [7250-25]

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

## SESSION 6

**Conv. Ctr. Room A4/A5: . . . . . Tues. 2:00 to 3:20 pm**

### Mobile Imaging

*Session Chair*: **Feng Xiao,** Motorola, Inc.

2:00 pm: **Mobile Imaging: The Big Challenge of the Small Pixel**, Feng Xiao, Fairchild Imaging (United States); Joyce E. Farrell, Peter B. Catrysse, Brian Wandell, Stanford Univ. (United States) . . . . . [7250-34]

2:20 pm: **Reduction of motion blur for handheld captured images by joint stabilization and spatio-temporal denoising**, Alfio Castorina, Giuseppe Spampinato, Arcangelo Bruna, Alessandro Capra, STMicroelectronics (Italy). . . . [7250-07]

2:40 pm: **Real time flicker detection performance in cell phone cameras**, Graham Greenland, Sergio R. Goma, Milivoje Aleksic, Advanced Micro Devices, Inc. (Canada) . . . . . [7250-14]

3:00 pm: **Extended depth-of-field using sharpness transport across color channels**, Frédéric Guichard, Imène Tarchouna, Marine Pyanet, Régis Tessières, Frédéric Cao, DxO Labs. (France). . . . . [7250-24]

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

## SESSION 7

**Conv. Ctr. Room A4/A5: . . . . . Tues. 4:00 to 5:00 pm**

### Computational Photography

*Session Chair*: **Frédéric Guichard,** DxO Labs. (France)

4:00 pm: **People first: separating people from background in digital photographs**, Mihai Ciuc, Tessera Romania SRL (Romania) and Univ. Politehnica Bucuresti (Romania); Adrian Capata, Tessera Romania SRL (Romania); Alexandru F. Drimbarean, Tessera Ireland Ltd. (Ireland); Eran Steinberg, Tessera (FotoNation) Inc. (United States); Adrian Zamfir, Tessera Romania SRL (Romania) . . . . . [7250-03]

4:20 pm: **Automatic background generation from a sequence of images based on robust mode estimation**, Désiré Sidibé, Olivier Strauss, William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France) . . . . . [7250-41]

4:40 pm: **High-dynamic range to low-dynamic range tone mapping utilizing eye tracking,** Corey Manders, Farzam Farbiz, A*STAR Institute for Infocomm Research (Singapore) . . . . . [7250-22]

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Nonlinear color-image decomposition for image processing of a digital color camera**, Takahiro Saito, Haruya Aizawa, Daisuke Yamada, Takashi Komatsu, Kanagawa Univ. (Japan) . . . . . [7250-02]

**Measuring the spectral response with a set of interference filters**, Christian Mauer, Image Engineering Dietmar Wüller (Germany) . . . . . [7250-08]

**Improved feature-points tracking for video stabilization**, Sebastiano Battiato, Giovanni Gallo, Giovanni Puglisi, Univ. degli Studi di Catania (Italy); Salvo Scellato, Scuola Superiore di Catania (Italy) . . . . . [7250-10]

**Chromatic aberration reduction through optical feature modeling**, Jooyoung Kang, SAMSUNG Electronics Co., Ltd. (South Korea); Hyunwook Ok, Samsung Advanced Institute of Technology (South Korea); JaemGuyn Lim, SAMSUNG Electronics Co., Ltd. (South Korea); Seong-Deok Lee, Samsung Advanced Institute of Technology (South Korea). . . . . [7250-16]

**Exposure-adaptive color-image enhancement**, Jaehyun Kwon, Wonhee Choe, Seong-Deok Lee, Chang-Yeong Kim, Samsung Advanced Institute of Technology (South Korea). . . . . [7250-27]

**Statistical identification and analysis of defect development in digital imagers**, Jenny Leung, Glenn H. Chapman, Simon Fraser Univ. (Canada); Israel Koren, Zahava Koren, Univ. of Massachusetts, Amherst (United States)[7250-29]

**IDEAL: an image pre-processing architecture for high-end professional DSC applications**, Auke van der Heide, Takashi Urano, Frank Polderdijk, Wim de Haan, Jan Bosiers, DALSA Corp. (Netherlands) . . . . . [7250-38]

**Fusion of high dynamic range scene photos**, Ekaterina V. Tolstaya, Michael N. Rychagov, Samsung Electronics Co., Ltd. (Russian Federation); Ki-Min Kang, Sang-Ho Kim, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . [7250-44]

**Retargeting of digital photos and documents**, Victor V. Bucha, Ilia V. Safonov, Michael N. Rychagov, SAMSUNG Electronics Co., Ltd. (Russian Federation); Jin-Kyung Hong, Sang-Ho Kim, SAMSUNG Electronics Co., Ltd. (Korea, Republic of) . . . . . [7250-45]

**Visual model of human blur perception for scene adaptive capturing**, Sung-Su Kim, DaeSu Chung, Jung-Bae Kim, Seong-Deok Lee, Samsung Advanced Institute of Technology (South Korea). . . . . [7250-20]

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC504 Introduction to CCD and CMOS Imaging Sensors and Applications (Janesick) Monday, 8:30 am to 5:30 pm |
| SC807 Digital Camera and Scanner Performance Evaluation: Science, Standards and Software (Burns, Williams) Sunday, 8:30 am to 5:30 pm |
| SC870 Color Processing and its Characterisation for Digital Photography (Matherson, Wueller) Sunday, 8:30 am to 12:30 pm |
| SC916 Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick) Tuesday, 8:30 am to 5:30 pm |
| SC929 Digital Photographic Technology (Kriss) Wednesday, 8:30 am to 5:30 pm |

# Conference 7251

Wednesday-Thursday 20-22 January 2009 • Proceedings of SPIE Vol. 7251

# Image Processing: Machine Vision Applications II

*Conference Chairs:* **Kurt S. Niel,** Fachhochschule Wels (Austria); **David Fofi,** Univ. de Bourgogne (France)

*Program Committee:* **Pierrick T. Bourgeat,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Michael J. Cree,** The Univ. of Waikato (New Zealand); **Marc M. Ellenrieder,** Carl Zeiss Optronics GmbH (Germany); **Lixin Fan,** Nokia Research Ctr. (Finland); **Ewald Fauster,** vatron GmbH (Austria); **Steven P. Floeder,** 3M Co.; **Luciano F. Fontoura Da Costa,** Univ. de São Paulo (Brazil); **Ralph M. Ford,** The Pennsylvania State Univ.; **Edmund Yin-Mun Lam,** The Univ. of Hong Kong (Hong Kong China); **Fabrice Meriaudeau,** Univ. de Bourgogne (France); **Dinesh Nair,** National Instruments Corp.; **Jeffery R. Price,** Oak Ridge National Lab.; **A. Ravishankar Rao,** IBM Thomas J. Watson Research Ctr.; **Joaquim Salvi,** Univ. de Girona (Spain); **Hamed Sari-Sarraf,** Texas Tech Univ.; **Ralph Seulin,** Univ. de Bourgogne (France); **Kenneth W. Tobin, Jr.,** Oak Ridge National Lab.; **Yvon Voisin,** Univ. de Bourgogne (France)

## Tuesday 20 January

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

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*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.*

**Optimized features allocation technique for improved-automated alignment of wafers**, Michael Parshin, Zeev Zalevsky, Bar-Ilan Univ. (Israel). . . . . [7251-32]

**Stereoscopic 3D Reconstruction using Motorized Zoom Lenses within an Embedded System**, Andrew R. Willis, Pengcheng Liu, Yunfeng Sui, The Univ. of North Carolina at Charlotte (United States). . . . . [7251-33]

**A comparative study of several supervised classifiers for coconut palm trees fields' type mapping on 80-cm RGB pansharpened Ikonos images**, Raimana Teina, Univ. Pierre et Marie Curie (France); Dominique Bériziat, INRIA Rocquencourt (France); Benoit Stoll, Sébastien Chabrier, Univ. de la Polynésie Française (French Polynesia). . . . . [7251-34]

**Color correction using color-flow Eigenspace model in color face recognition**, Jae Young Choi, Yong Man Ro, Information and Communications Univ. (South Korea) . . . . . [7251-35]

**Fusion of lidar and aerial imagery for accurate building footprint extraction**, Sakina Zabuawala, Hieu Nguyen, Hai Wei, Jacob Yadegar, UtopiaCompression Corp. (United States). . . . . [7251-36]

**Evaluation of membrane stacking in electron microscope images**, Gilles Hermann, Argyro Karathanou, Jean Philippe Urban, Univ. de Haute Alsace (France) . . . . . [7251-37]

**Finger vein extraction using gradient normalization and principal curvature**, Joon Hwan Choi, Wonseok Song, Taejeong Kim, Seoul National Univ. (Korea, Republic of); Seung-Rae Lee, Seoul National Univ. (Korea, Republic of) and jFinger Co., Ltd. (Korea, Republic of); Hee Chan Kim, Seoul National Univ. College of Medicine (Korea, Republic of) . . . . . [7251-38]

**Vision Based Auto Inspection System for Detecting Scratches on the Products**, Kadir Balci, Yildiz Teknik Univ. (Turkey); Fethullah Karabiber, Istanbul Univ. (Turkey); Abdullah Bal, Yildiz Teknik Univ. (Turkey) . . . . . [7251-39]

**Finger-image registration method using vein and knuckle patterns for biometric application**, SeungWoo Noh, Hyoun-Joong Kong, SangYun Park, JiMan Kim, Seung-Rae Lee, Taejeong Kim, Hee Chan Kim, Seoul National Univ. (Korea, Republic of). . . . . [7251-40]

**Orientated texture segmentation for detecting defects,** Sanjay N. Talbar, Shri Guru Gobind Singhji Institute of Engineering & Technology (India) . . . . [7251-41]

## Wednesday 21 January

### SESSION 1

**Conv. Ctr. Room A4: . . . . . .Wed. 9:30 am to 12:40 pm**

### Industrial Applications

9:30 am: **CANDUÎ in-reactor quantitative visual-based inspection techniques**, Paul A. Rochefort, AECL (Canada) . . . . . [7251-01]

9:50 am: **Fast hand-recognition method using limited area of IR-projection pattern**, Shoji Yamamoto, Tokyo Metropolitan College of Industrial Technology (Japan); Sayuri Kamimigaki, Norimichi Tsumura, Toshiya Nakaguchi, Yoichi Miyake, Chiba Univ. (Japan) . . . . . [7251-02]

10:10 am: **High-Resolution Inline Video-AOI for Printed Circuit Assemblies**, Benjamin Guthier, Stephan Kopf, Wolfgang Effelsberg, Univ. Mannheim (Germany) . . . . . [7251-03]

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

11:00 am: **Localised Contourlet features in Vehicle Make and Model Recognition**, Iffat Zafar, Eran A. Edirisinghe, Serpil Acar, Loughborough Univ. (United Kingdom). . . . . [7251-04]

11:20 am: **Discriminating poultry feeds by images analysis for the purpose of avoiding importunate poultry behaviors**, Rabie Hachemi, Nicolas Loménie, Nicole Vincent, Univ. Paris Descartes (France). . . . . [7251-05]

11:40 am: **3D reconstruction of hot-metallic surfaces for industrial part characterization**, Youssef Bokhabrine, Lew F. C. Lew Yan Voon, Ralph Seulin, Patrick Gorria, Univ. de Bourgogne (France) . . . . . [7251-06]

12:00 pm: **Assessing fabric stain release with a GPU implementation of statistical snakes**, Sridharan Kamalakannan, Arunkumar Gururajan, Muneem Shahriar, Matthew M. Hill, Joshua Anderson, Hamed Sari-Sarraf, Eric F. Hequet, Texas Tech Univ. (United States) . . . . . [7251-07]

12:20 pm: **Fingerprint Verification Using Directional Image and Local Features**, Edward K. Wong, Yao Wang, Polytechnic Univ. (United States); Syng Yup Ohn, Korean Aerospace Univ. (South Korea) . . . . . [7251-08]

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

## SESSION 2

**Conv. Ctr. Room A4: . . . . . .Wed. 2:00 to 4:50 pm**

### CV Algorithms for Industrial Applications

2:00 pm: **Introduction of a wavelet transform based on 2D matched filter in a Markov Random Field for fine structure extraction: Application on road crack detection**, Sylvie Chambon, Lab. Central des Ponts et Chaussées Nantes (France); Peggy Subirats, Ctr. d'Etudes Techniques de l'Equipement Normandie Ctr. (France); Jean Dumoulin, Lab. Central des Ponts et Chaussées Nantes (France) . . . . . [7251-79]

2:20 pm: **Anomaly based vessel detection in visible and infrared images**, Mohammad Moinul Islam, Mohammed Nazrul Islam, Vijayan K. Asari, Mohammad A. Karim, Old Dominion Univ. (United States). . . . . [7251-10]

2:40 pm: **A new morphological segmentation algorithm for biomedical imaging applications**, Dimitris S. Gorpas, Petros Maragos, Dido M. Yova, National Technical Univ. of Athens (Greece). . . . . [7251-11]

3:00 pm: **Detection of low-contrasted membranes in electron-microscope images: statistical contour validation**, Argyro Karathanou, Jean-Luc Buessler, Hubert Kihl, Jean-Philippe Urban, Univ. de Haute Alsace (France) . . . . [7251-12]

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

3:50 pm: **Enhancing the motion estimate in bundle adjustment using projective Newton-type optimization on the manifold**, Michel Sarkis, Klaus Diepold, Alexander Schwing, Technische Univ. München (Germany) . . [7251-13]

4:10 pm: **Current state-of-the-art of vision-based SLAM**, Naveed Muhammad, David Fofi, Samia Ainouz, Univ. de Bourgogne (France) . . . . . [7251-14]

4:30 pm: **Perspective Planar Shape Matching**, Andreas Hofhauser, Technische Univ. München (Germany); Carsten Steger, MVTec Software GmbH (Germany); Nassir Navab, Technische Univ. München (Germany) . . . . . [7251-16]

# Thursday 22 January

## SESSION 3

**Conv. Ctr. Room A4: . . . . . .Thurs. 8:30 to 9:30 am**

### Multispectral Imaging

8:30 am: **Theory and Applications of Frequency Image of Color Vectors**, Toshiyuki Kashiwagi, Tokushima Prefectural Industrial Technology Ctr. (Japan); Shunichiro Oe, Univ. of Tokushima (Japan) . . . . . [7251-17]

8:50 am: **Classical and hyperspectral machine-vision logics applied to hazelnut quality assessment**, Giuseppe Bonifazi, Laura D'Aniello, Aldo Gargiulo, Silvia Serranti, Univ. degli Studi di Roma, La Sapienza (Italy) . [7251-18]

9:10 am: **Comparative defect evaluation of aircraft components by active thermography**, Gerald Zauner, Guenther Mayr, Bernhard Dietermayr, Christoph Reiter, Guenther Hendorfer, Upper Austria Univ. of Applied Sciences (Austria) . . . . . [7251-19]

## SESSION 4

**Conv. Ctr. Room A4: . . . . . .Thurs. 9:30 to 10:30 am**

### 3D Applications and CT/MR

9:30 am: **3D Object Recognition Using Deformable Model for Negating Sensing Error**, Nobutaka Kimura, Toshio Moriya, Hitachi, Ltd. (Japan) [7251-20]

9:50 am: **Tracking a user's face and hands in three-dimension in real-time**, Corey Manders, Farzam Farbiz, A*STAR Institute for Infocomm Research (Singapore) . . . . . [7251-21]

10:10 am: **Mining remote-image repositories with application to Mars Rover stereoscopic image datasets**, Andrew R. Willis, The Univ. of North Carolina at Charlotte (United States) . . . . . [7251-22]

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

## SESSION 5

**Conv. Ctr. Room A4: . . . . . Thurs. 11:00 am to 12:40 pm**

### Multiresolution and Mathematical Fitting

11:00 am: **An Edge Detection Algorithm Based on Rectangular Gaussian Kernels for Machine Vision Applications**, Fuqin Deng, Edmund Y. Lam, The Univ. of Hong Kong (Hong Kong China); Shunming Fung, Jiangwen Deng, ASM Assembly Automation Ltd. (Hong Kong China). . . . . [7251-23]

11:20 am: **The detection of reflecting surfaces by a statistical model**, Qiang He, Mississippi Valley State Univ. (United States); Henry C. Chu, Univ. of Louisiana at Lafayette (United States). . . . . [7251-24]

11:40 am: **A simulation of automatic 3D acquisition and post-processing pipeline**, Arsalan Malik, Benjamin Loriot, Ralph Seulin, Patrick Gorria, Univ. de Bourgogne (France). . . . . [7251-25]

12:00 pm: **Multiple visual features for the computer authentication of Jackson Pollock's drip paintings: beyond box counting and fractals**, Mohammad Tanvir Irfan, Stony Brook Univ. (United States); David G. Stork, Ricoh Innovations, Inc. (United States) and Stanford Univ. (United States) . . . [7251-26]

12:20 pm: **Optical or mechanical aids to drawing in the early Renaissance? a geometric analysis of the trellis work in Robert Campin's**, Ashutosh Kulkarni, Stanford Univ. (United States); David G. Stork, Ricoh Innovations, Inc. (United States) and Stanford Univ. (United States) . . . . . [7251-27]

LunchBreak . . . . . 12:40 to 2:10 pm

## SESSION 6

**Conv. Ctr. Room A4: . . . . . .Thurs. 2:10 to 3:30 pm**

### HW Equipment

2:10 pm: **FPGA-based multisensor real-time machine vision for banknote printing**, Volker Lohweg, Rui Li, Ostwestfalen-Lippe Univ. of Applied Sciences (Germany); Johannes G. Schaede, Thomas Türke, KBA-GIORI S.A. (Switzerland); Harald Willeke, KBA-Bielefeld (Germany) . . . . . [7251-28]

2:30 pm: **Multiple return identification for a full-field ranger via continuous waveform modelling**, John P. Godbaz, Michael J. Cree, Adrian A. Dorrington, The Univ. of Waikato (New Zealand) . . . . . [7251-29]

2:50 pm: **Machine vision for automated inspection of railway traffic recordings**, Caroline Machy, Multitel A.S.B.L. (Belgium) . . . . . [7251-30]

3:10 pm: **High-performance camera for industrial web inspection**, Johannes Fürtler, Austrian Research Ctrs. Seibersdorf Research GmbH (Austria) and Vienna Technical Univ. (Austria); Ernst Bodenstorfer, Michael Rubik, Konrad J. Mayer, Austrian Research Ctrs. Seibersdorf Research GmbH (Austria); Christian Eckel, Oregano Systems Design & Consulting GmbH (Austria). . . . . [7251-31]

# Conference 7252

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7252

# Intelligent Robots and Computer Vision XXVI: Algorithms and Techniques

*Conference Chairs:* **David P. Casasent,** Carnegie Mellon Univ.; **Ernest L. Hall,** Univ. of Cincinnati; **Juha Röning,** Univ. of Oulu (Finland)

*Program Committee:* **Norbert Lauinger,** CORRSYS 3D Sensors AG (Germany); **Dah Jye Lee,** Brigham Young Univ.; **Charles A. McPherson,** The Charles Stark Draper Lab., Inc.; **Kurt S. Niel,** Fachhochschule Wels (Austria); **Yoshihiko Nomura,** Mie Univ. (Japan); **Greg Pearly,** BAE Systems; **Wolfgang Pölzleitner,** Sensotech GmbH (Austria); **Daniel Raviv,** Florida Atlantic Univ.; **Neelima Shrikhande,** Central Michigan Univ.; **Oliver Sidla,** SLR Engineering (Austria); **Bernard L. Theisen,** U.S. Army Tank-automotive and Armaments Command; **Dili Zhang,** Monotype Imaging

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room C4:. . . . . Mon. 8:30 to 10:30 am**

**Computer Vision and Robotics Invited Session**

*Session Chair*: **David P. Casasent,** Carnegie Mellon Univ.

8:30 am: **Fast FFT-based distortion-invariant kernel filters for general object recognition** *(Invited Paper)*, Rohit Patnaik, David P. Casasent, Carnegie Mellon Univ. (United States) . . . . . [7252-01]

9:00 am: **Architectures for intelligent robots in the age of exploitation** *(Invited Paper)*, Ernest L. Hall, Univ. of Cincinnati (United States). . . . . [7252-02]

9:30 am: **Micromanipulation platform for nanoscale applications** *(Invited Paper)*, Risto Sipola, Tero J. Vallius, Marko Pudas, Juha Röning, Univ. of Oulu (Finland). . . . . [7252-03]

10:00 am: **The 16TH Annual Intelligent Ground Vehicle Competition: intelligent students creating intelligent vehicles** *(Invited Paper)*, Bernard L. Theisen, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States) . . . . . [7252-04]

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

### SESSION 2

**Conv. Ctr. Room C4:. . . . . Mon. 11:00 to 11:40 am**

**Face Detection and Tracking**

*Session Chair*: **Oliver Sidla,** SLR Engineering (Austria)

11:00 am: **Multiview face detection using multilayer chained structure**, Jung-Bae Kim, Samsung Advanced Institute of Technology (South Korea); Haibing Ren, Samsung Electronics Co., Ltd. (China); SeongDeok Lee, Samsung Advanced Institute of Technology (South Korea) . . . . . [7252-06]

11:20 am: **Detecting low-resolution faces in video**, Neil M. Robertson, Heriot-Watt Univ. (United Kingdom) and Edinburgh Univ. (United Kingdom); Nils Janssen, Heriot-Watt Univ. (United Kingdom) . . . . . [7252-07]

Lunch Break . . . . . 11:45 to 1:00 pm

### SESSION 3

**Conv. Ctr. Room C4:. . . . . Mon. 1:00 to 2:40 pm**

**New Techniques for 3D and Shape Information**

*Session Chair*: **Ernest L. Hall,** Univ. of Cincinnati

1:00 pm: **Synthetic aperture method for GPR considering depth-changed shape of reflected waveform**, Hirofumi Kotaki, Yoshihiko Nomura, Hirokazu Fujii, Mie Univ. (Japan) . . . . . [7252-08]

1:20 pm: **Depth-from-trajectories for uncalibrated multiview video**, Paul A. Ardis, Univ. of Rochester (United States); Amit Singhal, Eastman Kodak Co. (United States); Christopher M. Brown, Univ. of Rochester (United States) . . . . . [7252-09]

1:40 pm: **Method of geometric alignment for pair of large point cloud using sparse overlap areas**, Keisuke Fujimoto, The Univ. of Electro-Communications (Japan); Nobutaka Kimura, Fumiko Beniyama, Toshio Moriya, Hitachi, Ltd. (Japan); Yasuichi Nakayama, The Univ. of Electro-Communications (Japan). . . . . [7252-10]

2:00 pm: **A probabilistic approach for the reconstruction of polyhedral objects using shape from shading technique**, Manoj Kumar, R. Balasubramanian, Rama Bhargava, Indian Institute of Technology Roorkee (India); Krishnan Swaminathan, Indian Institute of Technology Madras (India). . . . . [7252-12]

2:20 pm: **Predictive 3D vision: robust object and line detection for autonomous navigation using mixed Kalman and H-Infinity filtering on streaming stereo images**, Donald W. Rosselot, Ernest L. Hall, Mark Aull, Univ. of Cincinnati (United States) . . . . . [7252-13]

Coffee Break . . . . . 2:40 to 3:30 pm

### SESSION 4

**Conv. Ctr. Room C4:. . . . . Mon. 3:30 to 4:40 pm**

**Pedestrian Detection and Tracking**

*Session Chair*: **Oliver Sidla,** SLR Engineering (Austria)

3:30 pm: **Shape models and shape matching for pedestrian detection** *(Invited Paper)*, Oliver Sidla, Sensotech Forschungs- und Entwicklungs GmbH (Austria) . . . . . [7252-14]

4:00 pm: **Homography based multiple-camera person tracking**, Matthew R. Turk, Rochester Institute of Technology (United States). . . . . [7252-17]

4:20 pm: **Hybrid Real-Time Tracking of Non-Rigid Objects Under Occlusions**, Wonkyum Lee, Joohwan Chun, Korea Advanced Institute of Science and Technology (South Korea); Byung In Choi, Samsung Thales Co., Ltd. (South Korea); YuKyung Yang, Sungho Kim, Agency for Defense Development (Korea, Republic of) . . . . . [7252-18]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

## SESSION 5

**Conv. Ctr. Room C4: . . . . . .Tues. 10:30 to 11:30 am**

### Intelligent Ground Vehicle Competition

*Session Chairs*: **Bernard L. Theisen,** U.S. Army Tank-Automotive Research, Development and Engineering Ctr.; **Ernest L. Hall,** Univ. of Cincinnati

10:30 am: **Combining a modified vector field histogram algorithm and real-time image processing for unknown environment navigation**, Kumud Nepal, Adam Fine, Nabil Imam, David Pietrocola, Neil Robertson, David J. Ahlgren, Trinity College (United States) . . . . . [7252-23]

10:50 am: **Development of a Vision System for an Intelligent Ground Vehicle**, Robert L. Nagel, Kenneth Perry, Robert B. Stone, Missouri Univ. of Science and Technology (United States); Daniel A. McAdams, Texas A&M Univ. (United States) . . . . . [7252-24]

11:10 am: **Kratos: Princeton University's entry in the 2008 IGVC**, Robert Schapire, Christopher Baldassano, David Benjamin, Benjamin Chen, Gordon Franken, Will Hu, Jonathan Mayer, Andrew Saxe, Thomas Yeung, Derrick Yu, Princeton Univ. (United States) . . . . . [7252-25]

## SESSION 6

**Conv. Ctr. Room C4: . . . . . Tues. 11:30 am to 12:50 pm**

### Mobile and Cognitive Robotics

*Session Chair*: **Bernard L. Theisen,** U.S. Army Tank-Automotive Research, Development and Engineering Ctr.

11:30 am: **Robotic construction engineering equipment**, Bernard L. Theisen, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States); Paul Richardson, Univ. of Michigan (United States) . . . . . [7252-19]

11:50 pm: **Convoy active safety technologies War Fighter Experiment II**, Edward W. Schoenherr, U.S. Army Tank Automotive and Armaments Command (United States) . . . . . [7252-20]

12:10 pm: **Locating and tracking objects by efficient comparison of real and predicted synthetic video imagery**, Damian M. Lyons, Fordham Univ. (United States); D. Paul Benjamin, Pace Univ. (United States) . . . . . [7252-21]

12:30 pm: **Robust brand detection as a mobile vision service** *(Presentation Only)*, Lucas Paletta, JOANNEUM RESEARCH Forschungsgesellschaft mbH (Austria); Kumar Gaurav, Indian Institute of Technology Roorkee (India); Gerald Fritz, JOANNEUM RESEARCH Forschungsgesellschaft mbH (Austria) . [7252-22]

Lunch/Exhibition Break . . . . . 12:500 to 2:30 pm

## SESSION 7

**Conv. Ctr. Room C4: . . . . . Tues. 2:30 to 4:40 pm**

### Scene Analysis, Localization, and Computer Vision I

*Session Chairs*: **Ernest L. Hall,** Univ. of Cincinnati; **Juha Röning,** Univ. of Oulu (Finland)

2:30 pm: **Hand-gesture recognition and extracting from the video sequence acquired by a dynamic camera using condensation algorithm**, Dan Luo, Jun Ohya, Waseda Univ. (Japan) . . . . . [7252-31]

2:50 pm: **Scene Categorization with Multi-scale Category-specific Visual Words**, Jianzhao Qin, Nelson H. C. Yung, The Univ. of Hong Kong (Hong Kong China) . . . . . [7252-26]

3:10 pm: **Photographic expert-like capturing by analyzing scenes with representative image set**, Daesu Chung, Sungsu Kim, Jung-Bae Kim, Seongdeok Lee, Samsung Advanced Institute of Technology (South Korea) . . . . . [7252-27]

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

4:00 pm: **Learning the fusion of multiple video-analysis detectors**, Xavier Desurmont, Multitel A.S.B.L. (Belgium) . . . . . [7252-28]

4:20 pm: **Localizing objects using adaptive feature selection**, Youngkyoo Hwang, Jung-Bae Kim, Seongdeok Lee, Samsung Advanced Institute of Technology (South Korea) . . . . . [7252-29]

## SESSION 8

**Room: . . . . . Tues. 4:40 to 5:40 pm**

### Conputer Vision

*Session Chairs*: **Ernest L. Hall,** Univ. of Cincinnati; **Juha Röning,** Univ. of Oulu (Finland)

4:40 pm: **A study on SSD calculation between input image and subpixel-translated template image and its application to a subpixel image matching problem**, Hitoshi Nishiguchi, Yoshihiko Nomura, Mie Univ. (Japan) . . . [7252-30]

5:00 pm: **N-dimension geometry used in the design of a dynamic neural-network pattern-recognition system**, Chia-Lun J. Hu, Univ. of Colorado at Boulder (United States) . . . . . [7252-32]

5:20 pm: **THE Video Image Detector system which can adapt to changing circumstances,** Kim Hyunwoo, Kyungpook National Univ. (Korea, Republic of) . . . . . [7252-33]

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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 Paper session.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Using spatially varying pixels exposure technique for increasing accuracy of the optical-digital pattern recognition correlator**, Mikhail V. Konnik, Sergey N. Starikov, Moscow Engineering Physics Institute (Russia) . . . . . [7252-34]

**Visual Tracking Method Based on Target Feature Dynamic Extracting**, Jie Su, Harbin Univ. of Science and Technology (China); Guisheng Yin, . . . [7252-35]

# Conference 7253

Monday 19 January 2009 • Proceedings of SPIE Vol. 7253

# Multimedia Computing and Networking 2009

*Conference Chairs:* **Reza Rejaie,** Univ. of Oregon; **Ketan D. Mayer-Patel,** The Univ. of North Carolina at Chapel Hill

*Program Committee:* **Tarek F. Abdelzaher,** Univ. of Illinois at Urbana-Champaign; **Kevin C. Almeroth,** Univ. of California/Santa Barbara; **Scott A. Brandt,** Univ. of California/Santa Cruz; **Surendar Chandra,** Univ. of Notre Dame; **Mark Claypool,** Worcester Polytechnic Institute; **David Hung-Chang Du,** Univ. of Minnesota; **Wu-chi Feng,** Portland State Univ.; **Pascal Frossard,** École Polytechnique Fédérale de Lausanne (Switzerland); **Christos Gkantsidis,** Microsoft Ltd.; **Carsten Griwodz,** Simula Research Lab. (Norway); **Yang Guo,** Thomson Lab.; **Pål Halvorsen,** Simula Research Lab. (Norway); **Seon Ho Kim,** Univ. of Denver; **Baochun Li,** Univ. of Toronto (Canada); **Kang Li,** The Univ. of Georgia; **Andreas U. Mauthe,** Lancaster Univ. (United Kingdom); **Klara Nahrstedt,** Univ. of Illinois at Urbana-Champaign; **Wei-Tsang Ooi,** National Univ. of Singapore (Singapore); **Karsten Schwan,** Georgia Institute of Technology; **Subhabrata Sen,** Univ of Massachusetts/Amherst; **Nalini Venkatasubramanian,** Univ. of California/Irvine; **Dongyan Xu,** Purdue Univ.; **Zhi-Li Zhang,** Univ. of Minnesota; **Roger Zimmermann,** National Univ. of Singapore (Singapore); **Michael H. Zink,** Univ. of Massachusetts/Amherst

## Monday 19 January

**Conv. Ctr. Room B2 . . . . . .Mon. 8:25 to 8:30 am**

**Opening Remarks**

### SESSION 1

**Conv. Ctr. Room B2 . . . . . .Mon. 8:30 to 10:00 am**

**Coding**

8:30 am: **Visibility of individual packet loss on H.264 encoded video stream: a user study on the impact of packet loss on perceived video quality**, Mu Mu, Lancaster Univ (United Kingdom); Roswitha Gostner, Andreas U. Mauthe, Lancaster Univ. (United Kingdom); Francisco Garcia, Agilent Labs. (United Kingdom); Gareth Tyson, Lancaster Univ. (United Kingdom) . . . . . [7253-09]

9:00 am: **Optimal FEC code concatenation for unequal error protection in video streaming applications**, Lukasz Kondrad, Tampere Univ. of Technology (Finland); Imed Bouazizi, Nokia Research Ctr, (Finland); Vinod Kumar Malamal Vadakital, Nokia research Ctr. (Finland); Moncef Gabbouj, Tampere Univ. of Technology (Finland) . . . . . [7253-10]

9:30 am: **Cross-layer optimization of video streaming in single-hop wireless networks**, Mohamed M. Hefeeda, Cheng Hsin Hsu, Simon Fraser Univ. (Canada) . . . . . [7253-07]

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

### SESSION 2

**Conv. Ctr. Room B2 . . . . . .Mon. 10:30 am to 12:30 pm**

**Latency/Bandwidth Management**

10:30 am: **A two-tiered on-line server-side bandwidth reservation framework for the real-time delivery of multiple video streams**, Jorge Londoño, Azer Bestavros, Boston Univ. (United States) . . . . . [7253-13]

11:00 am: **Congestion control for layered video streaming**, Jean-Paul Wagner, Pascal Frossard, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7253-17]

11:30 am: **On the influence of latency estimation on dynamic group communication using overlays**, Knut-Helge Vik, Carsten Griwodz, Pål Halvorsen, Simula Research Lab. (Norway) . . . . . [7253-15]

12:00 pm: **Corelli: a peer-to-peer dynamic replication service for supporting latency-dependent content in community networks**, Gareth Tyson, Andreas U. Mauthe, Lancaster Univ. (United Kingdom); Sebastian Kaune, Technische Univ. Darmstadt (Germany); Mu Mu, Lancaster Univ. (United Kingdom); Thomas Plagemann, Univ. of Oslo (Norway). . . . . [7253-12]

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

### SESSION 3

**Conv. Ctr. Room B2 . . . . . .Mon. 2:00 to 3:30 pm**

**Mobile/Wireless/Sensor Net**

2:00 pm: **Multimedia application performance on a WiMAX network**, Emir Halepovic, Majid Ghaderi, Carey L. Williamson, Univ. of Calgary (Canada) . . . . . [7253-11]

2:30 pm: **Bounding switching delay in mobile TV broadcast networks**, Mohamed M. Hefeeda, Cheng Hsin Hsu, Simon Fraser Univ. (Canada) [7253-08]

3:00 pm: **Exploiting semantics for scheduling data collection from sensors on real-time to maximize event detection**, Ronen Vaisenberg, Sharad Mehrotra, Deva Ramanan, Univ. of California, Irvine (United States) . . . [7253-18]

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

### SESSION 4

**Conv. Ctr. Room B2 . . . . . .Mon. 4:00 to 5:30 pm**

**Miscellaneous**

4:00 pm: **Anatomy of a ubiquitous media center**, Manuel Serrano, INRIA (France) . . . . . [7253-14]

4:30 pm: **Time-triggered static schedulable dataflows for multimedia systems**, Pau Arumi, Fundacio barcelona Media/Univ. Pompeu Fabra (Spain); Xavier Amatriain, Telefonica Research (Spain) . . . . . [7253-16]

5:00 pm: **Characterization of social video,** Jeffrey R. Ostrowski, Nabil J. Sarhan, Wayne State Univ. (United States). . . . . [7253-06]

**Conv. Ctr. Room B2 . . . . . .Mon. 5:30 to 5:35 pm**

**Closing Remarks**

## Courses of Related Interest

*Register for courses on-site!*

SC813 MPEG Family of Video Compression Standards (Rabbani) Monday, 8:30 am to 5:30 pm

SC926 Secure Multimedia Communication & Systems (Agaian) Monday, 8:30 am to 5:30 pm

# Conference 7254

Monday-Wednesday 19-21 January 2009 • Proceedings of SPIE Vol. 7254

# Media Forensics and Security XI

*Conference Chairs:* **Edward J. Delp III,** Purdue Univ.; **Jana Dittmann,** Otto-von-Guericke-Univ. Magdeburg (Germany); **Nasir D. Memon,** Polytechnic Univ.; **Ping Wah Wong,** IDzap LLC

*Program Committee:* **Adnan M. Alattar,** Digimarc Corp.; **Mauro Barni,** Univ. degli Studi di Siena (Italy); **Patrick Bas,** Lab. des Images et des Signaux, CNRS (France); **Jeffrey A. Bloom,** THOMSON Corporate Research; **Hany Farid,** Dartmouth College; **Jessica Fridrich,** Binghamton Univ.; **Ton Kalker,** Hewlett-Packard Co.; **Andrew D. Ker,** Univ. of Oxford (United Kingdom); **Benoît Macq,** Univ. Catholique de Louvain (Belgium); **Bangalore S. 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.; **Bülent Sankur,** Bogaziçi Univ. (Turkey); **Gaurav Sharma,** Univ. of Rochester; **Qibin Sun,** A*STAR Institute for Infocomm Research (Singapore); **Claus Vielhauer,** Fachhochschule Brandenburg (Germany); **Sviatoslav V. Voloshynovskiy,** Univ. de Genève (Switzerland); **Min Wu,** Univ. of Maryland/College Park; **Husrev Taha Sencar,** TOBB University of Economics and Technology (Turkey)

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room C2 . . . . . .Mon. 9:00 to 12:00 pm**

#### Media Fingerprinting

*Session Chair*: **Regunathan Radhakrishnan,** Dolby Labs., Inc.

9:00 am: **Video Fingerprinting for Copy Identification: From Research to Industry Applications**, Jian Lu, Vobile, Inc. (United States) . . . . . [7254-01]

9:25 am: **Video fingerprinting for live events**, Mehmet U. Celik, Jaap Haitsma, Pavlo Barvinko, Gerhard C. Langelaar, Martijn Maas, Philips Research (Netherlands) . . . . . [7254-02]

9:50 am: **Machine-assisted editing of user generated content**, Markus Cremer, Randall Cook, Gracenote, Inc. (United States) . . . . . [7254-03]

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

10:45 am: **Image and video fingerprinting: applications**, Frédéric Lefebvre, Ayoub Massoudi, Bertrand Chupeau, Eric Diehl, Thomson (France) . . . [7254-04]

11:10 am: **Robust efficient video fingerprinting**, Jeffrey Lubin, Manika Puri, Sarnoff Corp. (United States) . . . . . [7254-05]

11:35 am: **A review of video fingerprints invariant to geometric attacks**, Regunathan Radhakrishnan, Wenyu Jiang, Claus Bauer, Dolby Labs., Inc. (United States) . . . . . [7254-07]

Lunch Break . . . . . 12:00 am to 1:20 pm

### SESSION 2

**Conv. Ctr. Room C2 . . . . . .Mon. 1:20 to 3:10 pm**

#### Steganography and Steganalysis

*Session Chair*: **Andrew D. Ker,** Univ. of Oxford (United Kingdom)

1:20 pm: **The Square Root Law of Steganographic Capacity for Markov Covers**, Tomas Filler, Binghamton Univ. (United States); Andrew D. Ker, Univ. of Oxford (United Kingdom); Jessica Fridrich, Binghamton Univ. (United States) . . . . . [7254-08]

1:50 pm: **The Impact of Information Fusion in Steganalysis on the Example of Audio Steganalysis**, Christian Kraetzer, Jana Dittmann, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . [7254-09]

2:10 pm: **Feature Reduction and Payload Location with WAM Steganalysis**, Andrew D. Ker, Ivans Lubenko, Univ. of Oxford (United Kingdom) . . . . [7254-10]

2:30 pm: **Model-based steganalysis using invariant features**, Tu-Thach Quach, Sandia National Labs. (United States); Fernando Pérez-González, Univ. de Vigo (Spain); Gregory L. Heileman, The Univ. of New Mexico (United States) . . . . . [7254-11]

2:50 pm: **From Blind to Quantitative Steganalysis**, Tomas Pevny, Gipsa-Lab, INPG (France); Jessica Fridrich, Binghamton Univ. (United States); Andrew D. Ker, Univ. of Oxford (United Kingdom) . . . . . [7254-12]

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

### SESSION 3

**Conv. Ctr. Room C2 . . . . . .Mon. 3:40 to 5:20 pm**

#### Theoretical Foundations

*Session Chair*: **Ton Kalker,** Hewlett-Packard Labs.

3:40 pm: **Conception and limits of robust perceptual hashing: toward side information assisted hash functions**, Sviatoslav V. Voloshynovskiy, Oleksiy J. Koval, Fokko P. Beekhof, Thierry Pun, Univ. de Genève (Switzerland). . [7254-13]

4:00 pm: **Expectation maximization decoding of Tardos probabilistic fingerprinting code**, Ana Charpentier, Fuchun Xie, Teddy Furon, Caroline Fontaine, INRIA Rennes (France) . . . . . [7254-14]

4:20 pm: **Joint Detection-Estimation Games for Sensitivity Analysis Attacks**, Maha M. El Choubassi, Pierre Moulin, Univ. of Illinois at Urbana-Champaign (United States) . . . . . [7254-15]

4:40 pm: **A detection-theoretic model for copy detectable images**, Justin Picard, ATT Advanced Track & Trace (France) . . . . . [7254-16]

5:00 pm: **On security threats for robust perceptual hashing**, Oleksiy J. Koval, Sviatoslav V. Voloshynovskiy, Univ. de Genève (Switzerland); Patrick Bas, François Cayre, Ecole Nationale Supérieure de Physique de Grenoble (France) . . . . . [7254-17]

## Tuesday 20 January

#### Plenary Presentation

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 4

**Conv. Ctr. Room C2 . . . . . .Tues. 10:30 to 11:30 am**

#### Media Forensics I

*Session Chair*: **Jessica Fridrich,** Binghamton Univ.

10:30 am: **Camera identification: large scale tests**, Miroslav Goljan, Jessica Fridrich, Tomas Filler, Binghamton Univ. (United States) . . . . . [7254-18]

10:50 am: **Detection and Description of Geometrically Transformed Digital Images**, Babak Mahdian, Stanislav Saic, Institute of Information Theory and Automation (Czech Republic) . . . . . [7254-20]

11:10 am: **Synthesis of color-filter array pattern in digital images**, Rainer Boehme, Matthias Kirchner, Technische Univ. Dresden (Germany) . . . . [7254-21]

## SESSION 5

**Conv. Ctr. Room C2 . . . . . Tues. 11:30 am to 12:10 pm**

### Media Forensics II

*Session Chair*: **Chad D. Heitzenrater,** Air Force Research Lab.

11:30 am: **Lighting analysis of diffusely illuminated tableaus in realist paintings: an application to detecting**, David G. Stork, Ricoh Innovations, Inc. (United States); Micah K. Johnson, Massachusetts Institute of Technology (United States) . . . . . [7254-23]

11:50 am: **A study of the robustness of PRNU-based camera identification**, Kurt Rosenfeld, Husrev T. Sencar, Polytechnic Univ. (United States) . . [7254-24]

Lunch/Exhibition Break . . . . . 12:10 to 1:40 pm

## SESSION 6

**Conv. Ctr. Room C2 . . . . . Tues. 1:40 to 3:40 pm**

### Cryptographic Techniques for Content Protection

*Session Chair*: **Dulce B. Ponceleon,** IBM Almaden Research Ctr.

1:40 pm: **Robust fingerprinting codes and applications**, Aggelos Kiayias, Univ. of Connecticut (United States) . . . . . [7254-25]

2:00 pm: **Practical tracing traitors**, Jeffrey Lotspiech, Lotspiech.com, LLC (United States); Hongxia Jin, IBM Almaden Research Ctr. (United States) . . . . . [7254-26]

2:20 pm: **Next generation DRM: cryptography or forensics?**, Arnaud Robert, Disney (United States) . . . . . [7254-27]

2:40 pm: **Stream it to me! Why is it challenging?**, Thomas Scott, Netflix, Inc. (United States) . . . . . [7254-28]

3:00 pm: **Alice and Bob go to the call center: caring for customers in a complex economy**, John Card II, Kate Landow, EchoStar Technologies LLC (United States) . . . . . [7254-29]

3:20 pm: **Broadcast encryption: paving the road to practical content protection systems**, Dulce B. Ponceleon, Donald Leake, Jr., Glenn Deen, IBM Almaden Research Ctr. (United States) . . . . . [7254-30]

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

## SESSION 7

**Conv. Ctr. Room C2 . . . . . Tues. 4:10 to 5:10 pm**

### Video

*Session Chair*: **Benoît Macq,** Univ. Catholique de Louvain (Belgium)

4:10 pm: **Video fingerprinting using distributed source coding**, Nitin Khanna, George T. Chiu, Jan P. Allebach, Edward J. Delp III, Purdue Univ. (United States) . . . . . [7254-46]

4:30 pm: **Exhibition QIM-based watermarking for digital cinema**, Pilar Callau, Rony M. Darazi, Benoît Macq, Univ. Catholique de Louvain (Belgium) . [7254-32]

4:50 pm: **Digital watermarking for digital cinema**, Martin Steinebach, Stefan Thiemert, Fraunhofer-Institut für Sichere Informations-Technologie (Germany) . . . . . [7254-33]

# Wednesday 21 January

### Plenary Presentation

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

## SESSION 8

**Conv. Ctr. Room C2 . . . . . Wed. 9:30 to 10:10 am**

### Data Hiding

*Session Chair*: **Scott A. Craver,** Binghamton Univ.

9:30 am: **Protocols for data hiding in pseudo-random state**, Scott A. Craver, Enping Li, Jun Yu, Binghamton Univ. (United States) . . . . . [7254-34]

9:50 am: **High-capacity data hiding in text documents**, Aravind K. Mikkilineni, George T. Chiu, Jan P. Allebach, Edward J. Delp, Purdue Univ. (United States) . . . . . [7254-35]

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

## SESSION 9

**Conv. Ctr. Room C2 . . . . . Wed. 10:40 am to 12:00 pm**

### Watermarking

*Session Chair*: **Adnan M. Alattar,** Digimarc Corp.

10:40 am: **Digital watermarking opportunities enabled by mobile media proliferation**, Sierra Modro, Ravi K. Sharma, Digimarc Corp. (United States) . . . . . [7254-36]

11:00 am: **Nielsen's active/passive metering system for audience measurement**, Arun Ramaswamy, Nielsen Media Research (United States) . . . . . [7254-37]

11:20 am: **Real-time application of digital watermarking to embed tactical metadata into full motion video captured from unmanned aerial systems**, Alex Philp, GCS Research (United States); Brett A. Bradley, John Stach, Tony F. Rodriguez, Digimarc Corp. (United States) . . . . . [7254-38]

11:40 am: **Binary forensic code for multimedia signals: resisting minority collusion attack**, W. Sabrina Lin, Univ. of Maryland, College Park (United States); Shan He, Jeffrey A. Bloom, THOMSON Corporate Research (United States) . . . . . [7254-39]

Lunch Break . . . . . 12:00 to 1:30 pm

## SESSION 10

**Conv. Ctr. Room C2 . . . . . .Wed. 1:30 to 3:00 pm**

### Authentication

*Session Chair*: **Gaurav Sharma,** Univ. of Rochester

1:30 pm: **Authenticating cropped and resized images using distributed source coding and expectation maximization**, Yao-Chung Lin, David Varodayan, Bernd Girod, Stanford Univ. (United States) . . . . . [7254-40]

2:00 pm: **Random projections-based item authentication**, Sviatoslav V. Voloshynovskiy, Oleksiy J. Koval, Fokko P. Beekhof, Thierry Pun, Univ. de Genève (Switzerland). . . . . [7254-41]

2:20 pm: **Perception-based audio authentication watermarking**, Sascha Zmudzinski, Martin Steinebach, Fraunhofer-Institut für Sichere Informations-Technologie (Germany) . . . . . [7254-42]

2:40 pm: **Improvements on image authentication and recovery using distributed source coding**, Nitin Khanna, Purdue Univ. (United States); Antoni Roca, Univ. Politécnica de Valencia (Spain); George T. Chiu, Jan P. Allebach, Edward J. Delp III, Purdue Univ. (United States). . . . . [7254-43]

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

## SESSION 11

**Conv. Ctr. Room C2 . . . . . .Wed. 3:30 to 4:50 pm**

### Miscellaneous

*Session Chair*: **Jeffrey A. Bloom,** THOMSON Corporate Research

3:30 pm: **Nested object watermarking for arbitrary shaped image annotations: performance evaluations**, Maik Schott, Jana Dittmann, Otto-von-Guericke-Univ. Magdeburg (Germany); Claus Vielhauer, Fachhochschule Brandenburg (Germany) and Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . [7254-44]

3:50 pm: **High capacity color barcodes using dot orientation and color separability**, Orhan Bulan, Univ. of Rochester (United States); Vishal Monga, Xerox Research Ctr. (United States); Gaurav Sharma, Univ. of Rochester (United States) . . . . . [7254-45]

4:10 pm: **Enabling Search Over Encrypted Multimedia Databases**, Wenjun Lu, Ashwin Swaminathan, Avinash L. Varna, Min Wu, Univ. of Maryland, College Park (United States). . . . . [7254-47]

4:30 pm: **RF Device Forensics Using Passband Filter Analysis**, Deen N. King-Smith, Aravind K. Mikkilineni, Edward J. Delp III, Purdue Univ. (United States) . . . . . [7254-48]

### Digital Watermarking Best Paper Award 2009

The Chair of each Watermarking Session of this Conference will nominate outstanding papers from their Session(s) for the Award, which will be reviewed by the Best Paper Selection Committee. The winning paper will be publicized in the 2009 Conference Proceedings, and the Award will be presented at Media Forensics and Security XII during Electronic Imaging 2010

This Award is sponsored by

DIGITAL WATERMARKING ALLIANCE

## Courses of Related Interest

*Register for courses on-site!*

SC872 Media Forensics - New Perspectives of Sensometrics and Tamper Detection (Creutzburg) Sunday, 1:30 to 5:30 pm

# Conference 7255

Wednesday-Thursday 21-22 January 2009 • Proceedings of SPIE Vol. 7255

# Multimedia Content Access: Algorithms and Systems III

*Conference Chairs:* **Raimondo Schettini,** Univ. degli Studi di Milano-Bicocca (Italy); **Ramesh C. Jain,** Univ. of California/Irvine; **Simone Santini,** Univ. Autónoma de Madrid (Spain)

*Conference Co-Chairs:* **Alan Hanjalic,** Technische Univ. Delft (Netherlands); **Nicu Sebe,** Univ. van Amsterdam (Netherlands); **Edward Y. Chang,** Google, Inc. (Taiwan); **Theo Gevers,** Univ. van Amsterdam (Netherlands)

*Program Committee:* **Kiyoharu Aizawa,** The Univ. of Tokyo (Japan); **Noboru Babaguchi,** Osaka Univ. (Japan); **Nozha Boujemaa,** INRIA Rocquencourt (France); **Tsuhan Chen,** Carnegie Mellon Univ.; **Tat-Seng Chua,** National Univ. of Singapore (Singapore); **Rita Cucchiara,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Alberto Del Bimbo,** Univ. degli Studi di Firenze (Italy); **Ajay Divakaran,** Sarnoff Corp.; **Chitra Dorai,** IBM Thomas J. Watson Research Ctr.; **Arun Hampapur,** IBM Thomas J. Watson Research Ctr.; **Alexander G. Hauptmann,** Carnegie Mellon Univ.; **Alejandro Jaimes,** Telefonica (Spain); **Mohan S. Kankanhalli,** National Univ. of Singapore (Singapore); **John R. Kender,** Columbia Univ.; **Josef Kittler,** Univ. of Surrey (United Kingdom); **Anil Christopher Kokaram,** The Univ. of Dublin, Trinity College (Ireland); **Clement H. C. Leung,** Victoria Univ. of Technology (Australia); **Michael S. Lew,** Univ. Leiden (Netherlands); **Rainer W. Lienhart,** Univ. Augsburg (Germany); **Alan F. Smeaton,** Dublin City Univ. (Ireland); **John R. Smith,** IBM Thomas J. Watson Research Ctr.; **Hari Sundaram,** Arizona State Univ.; **Ahmet Murat Tekalp,** Koc Univ. (Turkey); **Qi Tian,** The Univ. of Texas at San Antonio; **Alain Tremau,** Univ. Jean Monnet Saint-Etienne (France); **Joost van de Weijer,** Univ. Autonoma Barcelona (Spain); **Luc J. Van Gool,** Katholieke Univ. Leuven (Belgium); **Svetha Venkatesh,** Curtin Univ. of Technology (Australia); **Marcel Worring,** Univ. van Amsterdam (Netherlands); **Lei Zhang,** Microsoft Research Asia (China); **Andrew Zisserman,** Univ. of Oxford (United Kingdom)

## Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 1

**Conv. Ctr. Room B4 . . . . . Wed. 9:30 to 11:20 am**

**Video**

*Session Chair*: **Raimondo Schettini,** Univ. degli Studi di Milano-Bicocca (Italy)

9:30 am: **Discriminative genre-independent audio-visual scene change detection**, Kevin W. Wilson, Mitsubishi Electric Research Labs. (United States); Ajay Divakaran, Sarnoff Corp. (United States) . . . . . [7255-01]

9:50 am: **A random walk through human behavior**, Youssef Chahir, Youssef Zinbi, Mahmoud Ghoniem, Univ. de Caen Basse-Normandie (France) . [7255-02]

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

10:40 am: **Flexible user interface for efficient content-based video surveillance retrieval: design and evaluation**, Jerome Meessen, Mathieu Coterot, Multitel A.S.B.L. (Belgium); Christophe De Vleeschouwer, Univ. Catholique de Louvain (Belgium); Xavier Desurmont, Multitel A.S.B.L. (Belgium); Benoit Macq, Univ. Catholique de Louvain (Belgium). . . . . [7255-03]

11:00 am: **An Automated Object-Level Video Editing Tool**, Elsayed E. Hemayed, Cairo Univ. (Egypt) . . . . . [7255-04]

### SESSION 2

**Conv. Ctr. Room B4 . . . . . Wed. 11:20 am to 12:00 pm**

**Invited Presentation**

*Session Chair*: **Simone Santini,** Univ. Autónoma de Madrid (Spain)

11:20 am: **Title to be Announced** *(Invited Paper)*, , . . . . . [7255-05]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

### SESSION 3

**Conv. Ctr. Room B4 . . . . . Wed. 1:30 to 2:10 pm**

**Image Retrieval**

*Session Chair*: **Simone Santini,** Univ. Autónoma de Madrid (Spain)

1:30 pm: **ImageSeeker: A Content-based Image Retrieval System**, Elsayed E. Hemayed, HebatAllah Fouad, Alaa Tawfik, Reem Megahed, Samar Mohamed, Cairo Univ. (Egypt). . . . . [7255-06]

1:50 pm: **Extraction of salient regions of interest using visual attention models**, Gustavo B. Borba, Humberto R. Gamba, Univ. Tecnológica Federal do Paraná (Brazil); Oge Marques, Liam M. Mayron, Florida Atlantic Univ. (United States) . . . . . [7255-08]

### SESSION 4

**Conv. Ctr. Room B4 . . . . . Wed. 2:10 to 2:50 pm**

**Image Quality**

*Session Chair*: **Alejandro Jaimes,** Telefónica Investigación (Spain)

2:10 pm: **Research on Subjective Stereoscopic Image Quality Assessment**, Xu Wang, Mei Yu, You Yang, Gangyi Jiang, Ningbo Univ. (China) . . . . . [7255-09]

2:30 pm: **Image quality assessment in multimedia applications**, Raimondo Schettini, Fabrizio Marini, Gianluigi Ciocca, Univ. degli Studi di Milano-Bicocca (Italy) . . . . . [7255-10]

Coffee Break . . . . . 2:50 to 3:30 pm

### SESSION 5

**Conv. Ctr. Room B4 . . . . . .Wed. 3:30 to 4:30 pm**

**Semantics**

*Session Chair*: **Alejandro Jaimes,** Telefónica Investigación (Spain)

3:30 pm: **Document description: what works for images should also work for text ?**, Nicolas Hervé, Nozha Boujemaa, INRIA Rocquencourt (France); Michael E. Houle, National Institute of Informatics (Japan) . . . . . [7255-11]

3:50 pm: **Context based semantics for multimodal retrieval**, Simone Santini, Doina A. Dumitrescu, Univ. Autónoma de Madrid (Spain) . . . . . [7255-12]

4:10 pm: **Semantic classification, low level features, and relevance feedback for content-based image retrieval**, Raimondo Schettini, Claudio Cusano, Gianluigi Ciocca, Univ. degli Studi di Milano-Bicocca (Italy) . . . . . [7255-13]

## Thursday 22 January

### SESSION 6

**Conv. Ctr. Room B4 . . . . . .Thurs. 8:30 to 9:10 am**

**Image Analysis**

*Session Chair*: **Raimondo Schettini,** Univ. degli Studi di Milano-Bicocca (Italy)

8:30 am: **Learning approach for multicontent analysis of compound images**, Quentin J. A. Besnehard, Univ. de Poitiers (France); Cedric Marchessoux, Tom R. L. Kimpe, Barco N.V. (Belgium); Guillaume Spalla, Arnaud Joubel, François Boudet, Univ. de Poitiers (France). . . . . [7255-14]

8:50 am: **Overlapping tiling for fast random access of low-dimensional data from high-dimensional datasets**, Zihong Fan, Antonio Ortega, Univ. of California, Los Angeles (United States). . . . . [7255-15]

### SESSION 7

**Conv. Ctr. Room B4 . . . . . .Thurs. 9:10 to 10:10 am**

**Medical and Scientific Imaging**

*Session Chair*: **Raimondo Schettini,** Univ. degli Studi di Milano-Bicocca (Italy)

9:10 am: **An annotation database for multimodal scientific data**, Cristina Bogdanschi, Simone Santini, Univ. Autónoma de Madrid (Spain) . . . . . [7255-16]

9:30 am: **A model of multimodal fusion for medical applications**, Lynn S. Yang, Indriyati Atmosukarto, Joshua D. Franklin, James F. Brinkley M.D., Dan Suciu, Linda G. Shapiro, Univ. of Washington (United States) . . . . . [7255-17]

9:50 am: **Binary and nonbinary description of hypointensity for search and retrieval of brain MR images**, Devrim Unay, Xiaojing C. Chen, Philips Research (Netherlands); Mujdat Cetin, Aytul Ercil, Sabanci Univ. (Turkey); Radu S. Jasinschi, Ahmet Ekin, Philips Research (Netherlands) . . . . . [7255-18]

## Courses of Related Interest

*Register for courses on-site!*

SC813 MPEG Family of Video Compression Standards (Rabbani) Monday, 8:30 am to 5:30 pm

SC926 Secure Multimedia Communication & Systems (Agaian) Monday, 8:30 am to 5:30 pm

# Conference 7256

Monday-Tuesday 19-20 January 2009 • Proceedings of SPIE Vol. 7256

# Multimedia on Mobile Devices 2009

*Conference Chairs:* **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany); **David Akopian,** The Univ. of Texas at San Antonio

*Program Committee:* **Sos S. Agaian,** The Univ. of Texas at San Antonio; **Alan Chalmers,** Univ. of Bristol (United Kingdom); **Linda Breitlauch,** Mediadesign Hochschule Düsseldorf (Germany); **Jianfei Cai,** Nanyang Technological Univ. (Singapore); **Surendar Chandra,** Univ. of Notre Dame; **Chang Wen Chen,** Florida Institute of Technology; **Kenneth J. Crisler,** Motorola, Inc.; **David Scott Doermann,** Univ. of Maryland/College Park; **Uwe Dummann,** Siemens AG (Germany); **Elizabeth Dykstra-Erickson,** Kinoma, Inc.; **Stefan Edlich,** Technische Fachhochschule Berlin (Germany); **Lajos Hanzo,** Univ. of Southampton (United Kingdom); **Zhihai He,** Univ. of Missouri/Columbia; **Hendrik O. Knoche,** Univ. College London (United Kingdom); **Xin Li,** West Virginia Univ.; **Manzur M. Murshed,** Monash Univ.; **Sethuraman Panchanathan,** Arizona State Univ.; **Kari A. Pulli,** Nokia Research Ctr. Palo Alto; **Matthias Rauterberg,** Technische Univ. Eindhoven (Netherlands); **Phillip A. Regalia,** Institut National des Télécommunications (France); **Thomas Schwotzer,** Fachhochschule Brandenburg (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

## Monday 19 January

### SESSION 1

**Conv. Ctr. Room B1 . . . . . .Mon. 8:50 to 10:00 am**

#### Security and Services for Mobile Devices

*Session Chairs*: **Sos S. Agaian,** The Univ. of Texas at San Antonio; **David Akopian,** The Univ. of Texas at San Antonio

8:50 am: **A mobile-to-server link for wireless steganography** *(Invited Paper)*, David Akopian, Sos S. Agaian, Abhinav Kumar, The Univ. of Texas at San Antonio (United States); Reiner Creutzburg, Fachhochschule Brandenburg (Germany) and The Univ. of Texas at San Antonio (United States). . . . . [7256-01]

9:20 am: **Image Encryption Based on Edge Information**, Yicong Zhou, Karen A. Panetta, Tufts Univ. (United States); Sos S. Agaian, The Univ. of Texas at San Antonio (United States) . . . . . [7256-02]

9:40 am: **Scalable, remote, and low-cost solution for multimedia content providers**, Simone Merlini, Riccardo Gatti, Luca Bianchi, Luca Lombardi, Univ. degli Studi di Pavia (Italy) . . . . . [7256-03]

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

### SESSION 2

**Conv. Ctr. Room B1 . . . . . .Mon. 10:30 am to 12:10 pm**

#### Mobile Media Coding and Processing

*Session Chair*: **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany)

10:30 am: **On-demand learning system using 4K video source**, Akira Yutani, Yoshitsugu Manabe, Hideki Sunahara, Kunihiro Chihara, Nara Institute of Science and Technology (Japan) . . . . . [7256-04]

10:50 am: **Adaptive timeline aware client controlled HTTP streaming**, Sachin G. Deshpande, Sharp Labs. of America, Inc. (United States) . . . . . [7256-05]

11:10 am: **Progressive raster imagery beyond a means to overcome limited bandwidth**, René U. Rosenbaum, Sr., Heidrun Schumann, Univ. Rostock (Germany) . . . . . [7256-06]

11:30 am: **H.264/AVC Intra-only Coding (iAVC) Techniques for Video over Wireless Networks**, Ming Yang, Monica A. Trifas, Jacksonville State Univ. (United States); Guolun Xiong, Hubei Huanyu Auto-Lighting Co., Ltd. (China); Joshua Rogers, Jacksonville State University (United States) . . . . . [7256-07]

11:50 am: **New side information-generation method based on multiple refrence frames for distributed video coding**, Rongke Liu, Zhi Yue, Wei Hu, Beijing Univ. of Aeronautics and Astronautics (China) . . . . . [7256-08]

Lunch Break . . . . . 12:10 to 1:40 pm

### SESSION 3

**Conv. Ctr. Room B1 . . . . . .Mon. 1:40 to 3:00 pm**

#### Large Media Processing

*Session Chairs*: **Olli J. Silvén,** Univ. of Oulu (Finland); **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany)

1:40 pm: **Resource-saving image browsing based on JPEG2000, blurring, and progression**, René U. Rosenbaum, Sr., Heidrun Schumann, Univ. Rostock (Germany) . . . . . [7256-09]

2:00 pm: **Displaying high-dynamic range images on an iPhone**, Corey Manders, Farzam Farbiz, A*STAR Institute for Infocomm Research (Singapore) . . . . . [7256-10]

2:20 pm: **Adaptation of Web Pages and Images for Mobile Applications**, Stephan Kopf, Benjamin Guthier, Hendrik Lemelson, Wolfgang Effelsberg, Univ. Mannheim (Germany) . . . . . [7256-11]

2:40 pm: **Graphics hardware accelerated panorama builder for mobile phones**, Jari Hannuksela, Olli Silven, Miguel Bordallo Lopez, Janne Heikkilä, University of Oulu (Finland); Markku Vehviläinen, Nokia Research Center (Finland) . . . . . [7256-12]

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

### SESSION 4

**Conv. Ctr. Room B1 . . . . . .Mon. 3:30 to 5:20 pm**

#### Safety and Location

*Session Chairs*: **David Akopian,** The Univ. of Texas at San Antonio; **Helmar Burkhart,** Univ. of Basel (Switzerland)

3:30 pm: **Affordable Wearable Video System for Enhancement of Emergency Response Training** *(Invited Paper)*, Deen N. King-Smith, David S. Ebert, Timothy Collins, Edward J. Delp III, Purdue Univ. (United States) . . . . . [7256-13]

4:00 pm: **Performance study of a mobile preventive notification system (PreNotiS)**, Abhinav Kumar, David Akopian, Philip Chen, The Univ. of Texas at San Antonio (United States) . . . . . [7256-14]

4:20 pm: **An assisted GPS messaging for GPS simulators for embedded mobile positioning**, Pradeep Kashyap, David Akopian, The Univ. of Texas at San Antonio (United States); Abhay Samant, National Instruments India (India) . . . . . [7256-13]

4:40 pm: **Contextual Interaction for Geospatial Visual Analytics on Mobile Devices**, Avin Pattath, David Ebert, Purdue Univ. (United States); William Pike, Richard May, Pacific Northwest National Lab. (United States) . . . . . [7256-16]

5:00 pm: **Problem-Solving GPS Trails: Techniques and Scenarios for Mobile Learning**, Helmar Burkhart, Martin Guggisberg, Dominik Hofer, Juerg Senn, Univ. of Basel (Switzerland) . . . . . [7256-17]

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 5

**Conv. Ctr. Room B1 . . . . . Tues. 10:30 am to 12:20 pm**

**3D Video Delivery for Mobile Devices**

*Session Chairs*: **Namho Hur,** Electronics and Telecommunications Research Institute (Korea, Republic of); **Atanas P. Gotchev,** Tampere Univ. of Technology (Finland)

10:30 am: **Mobile 3D television: development of core technological elements and user-centered evaluation methods toward an optimized system** *(Invited Paper)*, Atanas P. Gotchev, Tampere Univ. of Technology (Finland); Aljoscha Smolic, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); Satu Jumisko-Pyykkö, Tampere Univ. of Technology (Finland); Dominik Strohmeier, Technische Univ. Ilmenau (Germany); Gözde Bozdagi Akar, Middle East Technical Univ. (Turkey); Nikolay Daskalov, Multi-Media Solutions Ltd (Bulgaria) . . . . . [7256-18]

11:00 am: **Verification of 3D mobile broadcasting service based on depth-image based rendering technique in terrestrial-DMB**, Gwang Soon Lee, Hyun Lee, Kugjin Yun, Bongho Lee, Namho Hur, Jin Woong Kim, Electronics and Telecommunications Research Institute (Korea, Republic of); KwangHee Jung, Young Kyung Park, Joong Kyu Kim, Sungkyunkwan Univ. (Korea, Republic of) . . . . . [7256-19]

11:20 am: **Use scenarios: mobile 3D television and video**, Dominik Strohmeier, Technische Univ. Ilmenau (Germany); Mandy Weitzel, Satu Jumisko-Pyykkö, Tampere Univ. of Technology (Finland). . . . . [7256-20]

11:40 am: **Imaging and display systems for 3D mobile phone application**, Min-Chul Park, Korea Institute of Science and Technology (Korea, Republic of); Jung-Young Son, Daegu Univ. (Korea, Republic of). . . . . [7256-21]

12:00 pm: **Efficient stereoscopic contents file format on the basis of ISO base media file format,** Kyuheon Kim, Jangwon Lee, Doug Young Suh, Gwang Hoon Park, Kyung Hee Univ. (Korea, Republic of) . . . . . [7256-22]

**San Jose Convention Center,**
**Exhibit Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

**Interactive Paper and Symposium Demonstration Session**

*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.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**A complexity scalable AVS video codec**, Chen Lei, Yiqiang Chen, Wen Ji, Institute of Computing Technology (China). . . . . [7256-23]

**Perceptual quality measurement of scalable video in mobile consumption environment**, Sohn Hosik, Cheon Seog Kim, Hana Yoo, Yong man Ro, Information and Communications Univ. (South Korea). . . . . [7256-24]

**A location-based notification- and visualization-system indicating social activities**, Sammy David, Stefan Edlich, Technische Fachhochschule Berlin (Germany) . . . . . [7256-25]

**An Android based location service using GSMCellID and GPS to obtain a graphical guide to the nearest cash machine**, Jurma F. Jacobsen, Stefan Edlich, Technische Fachhochschule Berlin (Germany) . . . . . [7256-26]

**A dynamic client/server message-exchange application for mobile phones**, Abhinav Kumar, David Akopian, Philip Chen, The Univ. of Texas at San Antonio (United States). . . . . [7256-27]

**Business, marketing, and revenue aspects of ambient media**, Artur R. Lugmayr, Jr., Tampere Univ. of Technology (Finland). . . . . [7256-28]

**The impact of culture backdrop in ambient learning**, Maxie Lutze, Reiner Creutzburg, Fachhochschule Brandenburg (Germany). . . . . [7256-29]

**The evolution of ambient learning and ambient learning in a mobile world**, Reiner Creutzburg, Fachhochschule Brandenburg (Germany) . . . . . [7256-30]

## Courses of Related Interest

*Register for courses on-site!*

SC813 MPEG Family of Video Compression Standards (Rabbani) Monday, 8:30 am to 5:30 pm

# Conference 7257

Tuesday-Thursday 20-22 January 2009 • Proceedings of SPIE Vol. 7257

# Visual Communications and Image Processing 2009

*Conference Chairs:* **Majid Rabbani,** Eastman Kodak Co.; **Robert L. Stevenson,** Univ. of Notre Dame

*Program Committee:* **Tinku Acharya,** Avisere, Inc.; **Rashid Ansari,** Univ. of Illinois at Chicago; **John G. Apostolopoulos,** Hewlett-Packard Labs.; **Michel Barlaud,** Univ. de Nice Sophia Antipolis (France); **Ulug Bayazit,** Isik Univ. (Turkey); **Vasudev Bhaskaran,** Marvell Semiconductor, Inc.; **Ali Bilgin,** The Univ. of Arizona; **Mireille Boutin,** Purdue Univ.; **Alan Conrad Bovik,** The Univ. of Texas at Austin; **Maja Bystrom,** The Photonics Ctr. at Boston Univ.; **A. Enis Cetin,** Bilkent Univ. (Turkey); **Chang Wen Chen,** Florida Institute of Technology; **Gerard de Haan,** Philips Research Labs. (Netherlands); **Edward J. Delp III,** Purdue Univ.; **Eric Dubois,** Univ. of Ottawa (Canada); **Frederic Dufaux,** École Polytechnique Fédérale de Lausanne (Switzerland); **Touradj Ebrahimi,** École Polytechnique Fédérale de Lausanne (Switzerland); **Onur G. Guleryuz,** DoCoMo Communications Labs. USA, Inc.; **Dake He,** IBM Thomas J. Watson Research Ctr.; **Ashish Jagmohan,** IBM Thomas J. Watson Research Ctr.; **Lina J. Karam,** Arizona State Univ.; **Janusz Konrad,** Boston Univ.; **C.-C. Jay Kuo,** Univ. of Southern California; **Reginald L. Lagendijk,** Technische Univ. Delft (Netherlands); **Shipeng Li,** Microsoft Research Asia (China); **Xin Li,** West Virginia Univ.; **Ligang Lu,** IBM Thomas J. Watson Research Ctr.; **Jiebo Luo,** Eastman Kodak Co.; **Enrico Magli,** Politecnico di Torino (Italy); **Michael W. Marcellin,** The Univ. of Arizona; **Peyman Milanfar,** Univ. of California/Santa Cruz; **Jens-Rainer Ohm,** RWTH Aachen (Germany); **Thrasyvoulos N. Pappas,** Northwestern Univ.; **William A. Pearlman,** Rensselaer Polytechnic Institute; **Fernando Pereira,** Instituto Superior Técnico (Portugal); **Béatrice Pesquet-Popescu,** Ecole Nationale Supérieure des Télécommunications (France); **Fatih M. Porikli,** Mitsubishi Electric Research Labs.; **Kenneth Rose,** Univ. of California/Santa Barbara; **Amir Said,** Hewlett-Packard Co.; **Paul Salama,** Indiana Univ.-Purdue Univ. at Indianapolis; **Dan Schonfeld,** Univ. of Illinois at Chicago; **Gaurav Sharma,** Univ. of Rochester; **Eckehard G. Steinbach,** Technische Univ. München (Germany); **Thomas Stockhammer,** Nomor Research (Germany); **Ming-Ting Sun,** Univ. of Washington; **Andrew G. Tescher,** AGT Associates; **Anthony Vetro,** Mitsubishi Electric Research Labs.; **Zhou Wang,** Univ. of Waterloo; **John W. Woods,** Rensselaer Polytechnic Institute; **Xiaolin Wu,** McMaster Univ. (Canada); **Zixiang Xiong,** Texas A&M Univ.; **Yongyi Yang,** Illinois Institute of Technology; **Heather H. Yu,** Panasonic Information & Networking Technologies Lab.; **Jun Zhang,** Univ. of Wisconsin/Milwaukee

*Cosponsored by:*

## Tuesday 20 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Tues. 8:00 to 8:50 am**

**Neptune's Garden: Exploring the Secrets of the Deep Undersea**

**D. Gallo,** Woods Hole Oceanographic Institution (United States); **William Lange,** Research Specialist, Advanced Imaging and Visualization Laboratory, Woods Hole Oceanographic Institution

*See page 5 for information.*

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

### SESSION 1

**Conv. Ctr. Room B2 . . . . . .Tues. 10:30 to 11:50 am**

**Video Coding I**

10:30 am: **Motion vector quantization for efficient low bit-rate video coding**, Marco Cagnazzo, TELECOM ParisTech (France); Marie Andrée Agostini, Marc Antonini, Univ. de Nice Sophia Antipolis (France); Joel Jung, France Telecom R&D (United States); Guillaume Laroche, France Telecom R&D (France)[7257-01]

10:50 am: **An approach to enhanced definition video coding using adaptive warping**, Ying Chen, Mark J. T. Smith, Edward J. Delp III, Purdue Univ. (United States) . . . . . [7257-02]

11:10 am: **Multihypothesis prediction using decoder side-motion vector derivation in inter-frame video coding**, Steffen Kamp, Johannes Ballé, Mathias Wien, RWTH Aachen (Germany) . . . . . [7257-03]

11:30 am: **rho-domain based rate-control scheme for spatial, temporal, and quality scalable video coding**, Yohann Pitrey, IETR-INSA de Rennes (France) and Thomson R&D France (France); Marie Babel, Olivier Deforges, IETR-INSA de Rennes (France); Jerome Vieron, Thomson R&D France (France) . . . . . [7257-04]

### SESSION 2

**Conv. Ctr. Room B2 . . . . . Tues. 11:50 am to 12:50 pm**

**Video Coding II**

11:50 am: **Parallel entropy decoding for high-resolution video coding**, Andrew Segall, Jie Zhao, Sharp Labs. of America, Inc. (United States). . . . . [7257-05]

12:10 pm: **Rank reduction for low-bitrate coding of dynamic texture video**, Mauritz H. Panggabean, Eindhoven Univ. of Technology (Netherlands); Stijn de Waele, Karel J. Hinnen, Philips Research Labs. Eindhoven (Netherlands); Peter H. N. de With, Eindhoven Univ. of Technology (Netherlands) and Cyclomedia Technologies (Netherlands). . . . . [7257-06]

12:30 pm: **Adaptive reconstruction for Wyner-Ziv video coders**, Antoni Roca Perez, Josep Prades-Nebot, Univ. Politécnica de Valencia (Spain); Edward J. Delp, Purdue Univ. (United States) . . . . . [7257-07]

Lunch/Exhibition Break . . . . . 12:50 to 2:00 pm

## Courses of Related Interest

*Register for courses on-site!*

| |
|---|
| SC060 Stereoscopic Display Application Issues (Merritt, Woods) Sunday, 8:30 am to 5:30 pm |
| SC468 Image Enhancement and Deblurring (Rabbani) Sunday, 8:30 am to 5:30 pm |
| SC813 MPEG Family of Video Compression Standards (Rabbani) Monday, 8:30 am to 5:30 pm |

## SESSION 3

**Conv. Ctr. Room B2 . . . . . Tues. 2:00 to 3:40 pm**

### Object Detection and Recognition

2:00 pm: **Improving object segmentation by reflection detection and removal**, Mustafa Karaman, Lutz Goldmann, Thomas Sikora, Technische Univ. Berlin (Germany) . . . . . [7257-08]

2:20 pm: **Real-time detection and recognition of traffic signs**, Ernst Herbschleb, Univ. of Technology Eindhoven (Netherlands); Peter De With, CycloMedia Technology B.V. (Netherlands) . . . . . [7257-09]

2:40 pm: **New models for real-time tracking using particle filtering**, Ka Ki Ng, Edward J. Delp, Purdue Univ. (United States) . . . . . [7257-10]

3:00 pm: **Multi-level human motion analysis for surveillance applications**, Weilun Lao, Jungong Han, Peter H. N. de With, Eindhoven Univ. of Technology (Netherlands) . . . . . [7257-11]

3:20 pm: **Estimate missing tensor data by face synthesis for expression recognition**, Huachun Tan, Hao Chen, Beijing Institute of Technology (China) . . . . . [7257-12]

Coffee Break . . . . . 3:40 to 4:20 pm

## SESSION 4

**Conv. Ctr. Room B2 . . . . . Tues. 4:20 to 5:40 pm**

### Image/Video Transmission

4:20 pm: **Video multicast using network coding**, Adarsh K. Ramasubramonian, John W. Woods, Rensselaer Polytechnic Institute (United States). . . . . [7257-13]

4:40 pm: **Image feature matching with network flow: a global optimization method**, Xinying He, Qixiang Ye, Jianbin Jiao, Graduate Univ. of Chinese Academy of Sciences (China) . . . . . [7257-14]

5:00 pm: **Wireless visual-sensor network resource allocation using cross-layer optimization**, Elizabeth S. Bentley, Air Force Research Lab. (United States); Lisimachos P. Kondi, Univ. of Ioannina (Greece); John D. Matyjas, Michael J. Medley, Air Force Research Lab. (United States) . . . . . [7257-15]

5:20 pm: **Sensor scheduling for lifetime maximization in user-centric sensor networks,** Chao Yu, Gaurav Sharma, Univ. of Rochester (United States)[7257-16]

**Conv. Ctr. Exhibition Hall 1: . . . . . Tues. 6:00 to 8:30 pm**

### Interactive Paper and Symposium Demonstration Session

*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.*

*Interactive Paper Session authors are asked to set up their poster papers between 8:00 am and 10:00 pm on Monday. Pushpins are provided; other supplies can be obtained by checking with Donna Smith at the Conference Registration Desk.*

*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.*

**Contour coding based on Markov modeling of differential chain codes**, Li Yu, Jack Koplowitz, Clarkson Univ. (United States) . . . . . [7257-51]

**A fast intra_4x4 mode selection method for H.264**, Yue Yu, Limin Wang, Motorola, Inc. (United States) . . . . . [7257-52]

**Feature evaluation by particle filter for adaptive object tracking**, Zhenjun Han, Qixiang Ye, Jianbin Jiao, Graduate Univ. of Chinese Academy of Sciences (China) . . . . . [7257-53]

**A high-capacity reversible watermarking scheme**, Marc Chaumont, William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France) . . . . . [7257-54]

**A 3D auto-regressive model for bidirectional prediction**, Yongbing Zhang, Debin Zhao, Harbin Institute of Technology (China); Siwei Ma, Peking Univ. (China); Ronggang Wang, France Telecom R&D Beijing (China); Wen Gao, Peking Univ. (China) . . . . . [7257-55]

**Multiframe superresolution based on block motion vector processing and kernel constrained convex set projection**, Miao Liu, Yuzhong Shen, Old Dominion Univ. (United States) . . . . . [7257-56]

**Improved Picture Rate Conversion Using Classification Based LMS-Filters**, Le An, Technische Univ. Eindhoven (Netherlands); Adrienne Heinrich, Philips Research (Netherlands); Claus N. Cordes, NXP Semiconductors (Netherlands); Gerard de Haan, Philips Research (Netherlands) . . . . . [7257-57]

**Wireless congestion control based on delivery of erroneous packets**, Jari Korhonen, Andrew Perkis, Norwegian Univ. of Science and Technology (Norway) . . . . . [7257-58]

**Efficient Frame Interpolation for Wyner-Ziv Video Coding**, Cagatay Dikici, Supélec (France); Thomas Maugey, TELECOM ParisTech (France); Marie Andrée Agostini, Univ. de Nice Sophia Antipolis (France); Olivier Crave, TELECOM ParisTech (France) and IRISA INRIA Rennes (France) . . . . . [7257-59]

**An Incremental Basic Unit Level QP Determination Algorithm for H.264/AVC Rate Control**, Yu Sun, Yimin Zhou, Univ. of Central Arkansas (United States); Zhidan Feng, Acxiom Corp. (United States); Zhihai He, Univ. of Missouri (United States) . . . . . [7257-60]

**Selecting frequency feature for license plate detection based on AdaBoost**, Huachun Tan, Beijing Institute of Technology (China); Yafeng Deng, Vimicro Corp. (China); Hao Chen, Beijing Institute of Technology (China) . . . . . [7257-61]

**Measurement of tag confidence in user generated contents retrieval**, Sihyoung Lee, Hyun Seok Min, Young Bok Lee, Yong Man Ro, Information and Communications Univ. (South Korea) . . . . . [7257-62]

**Novel context template design scheme for lossless color halftone image compression**, Sung-Bum Park, Woo-Sung Shim, Young-Ho Moon, Jong-Bum Choi, Dai-Woong Choi, Jae-Won Yoon, SAMSUNG Electronics Co., Ltd. (South Korea) . . . . . [7257-63]

**Intra prediction with spatial gradient**, Shohei Matsuo, Seishi Takamura, Kazuto Kamikura, Yoshiyuki Yashima, Nippon Telegraph and Telephone Corp. (Japan) . . . . . [7257-64]

**Utility-based packet scheduling in P2P mesh-based multicast**, Jacob Chakareski, Pascal Frossard, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7257-65]

**REGPROT: JPEG 2000 registry protection for lossy transmission channels**, Ângelo M. Arrifano, Manuela Pereira, Univ. da Beira Interior (Portugal); Marc Antonini, Univ. de Nice Sophia Antipolis (France); Mário M. Freire, Univ. da Beira Interior (Portugal). . . . . [7257-66]

**Optimized Anisotropic Spatial Transforms for Wavelet-Based Scalable Multi-View Video Coding**, Jens-Uwe Garbas, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Béatrice Pesquet-Popescu, Ecole Nationale Supérieure des Télécommunications (France); André Kaup, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [7257-67]

**Reduced resolution MPEG-2 to H.264 transcoder**, Hari Kalva, Florida Atlantic Univ. (United States); Gerardo Fernandez, Univ. de Castilla-La Mancha (Spain); Kelly Kunzelmann, Florida Atlantic Univ. (United States) . . . . . [7257-68]

**Visual salience metrics for image inpainting**, Paul A. Ardis, Univ. of Rochester (United States); Amit Singhal, Eastman Kodak Co. (United States) . . . . [7257-69]

**A comparison study of image spatial entropy**, Qolamreza R. Razlighi, Nasser Kehtarnavaz, Univ. of Texas at Dallas (United States) . . . . . [7257-70]

**Face and lip tracking in unconstrained imagery for improved automatic speech recognition**, Brandon Crow, Jane X. Zhang, California Polytechnic State Univ. (United States) . . . . . [7257-71]

## Wednesday 21 January

**Plenary Presentation**

**Marriott Ballroom: . . . . . Wed. 8:15 to 9:30 am**

**Audio and Video: Making It and Selling It in the 21st Century**

**Andrew Setos,** Fox Entertainment Group

*See page 6 for information.*

### SESSION 5

**Conv. Ctr. Room B2 . . . . . Wed. 9:30 to 10:50 am**

#### Stereoscopic and Multi-View Coding I

9:30 am: **Depth-based 2D-3D combined scene images for 3D multiview displays**, Vikas Ramachandra, Matthias Zwicker, Truong Q. Nguyen, Univ. of California, San Diego (United States) . . . . . [7257-17]

9:50 am: **Lifting scheme-based method for joint coding 3D-Stereo digital cinema with luminace correction and optimized prediction**, Rony M. Darazi, Annabelle Gouze, Benoit Macq, Univ. Catholique de Louvain (Belgium) [7257-18]

10:10 am: **Rate-distortion optimization with inter-view refreshment for stereoscopic video coding over error-prone networks**, Xinguang Xiang, Debin Zhao, Qiang Wang, Harbin Institute of Technology (China); Siwei Ma, Wen Gao, Peking Univ. (China) . . . . . [7257-19]

10:30 am: **Comparative encoding latency analysis for arbitrary multiview video prediction structures**, Pablo Carballeira, Julián Cabrera, Univ. Politécnica de Madrid (Spain); Antonio Ortega, Univ. of Southern California (United States); Fernando Jaureguizar, Narciso García, Univ. Politécnica de Madrid (Spain) . . . . . [7257-20]

Coffee Break . . . . . 10:50 to 11:20 am

### SESSION 6

**Conv. Ctr. Room B2 . . . . . Wed. 11:20 am to 12:20 pm**

#### Stereoscopic and Multi-View Coding II

11:20 am: **Multi-step Joint Bilateral Depth Upsampling**, Bram Riemens, Om Prakash Gangwal, NXP Semiconductors (Netherlands); Bart Barenbrug, Robert-Paul M. Berretty, Philips Research (Netherlands) . . . . . [7257-21]

11:40 am: **Fast mode decision for multiview video coding based on depth maps**, Gianluca Cernigliaro, Fernando Jaureguizar, Univ. Politécnica de Madrid (Spain); Antonio Ortega, Univ. of California, Los Angeles (United States); Julián Cabrera, Narciso N. García, Univ. Politécnica de Madrid (Spain). . . . . [7257-22]

12:00 pm: **Improving View Rendering Quality and Coding Efficiency by Suppressing Compression Artifacts in Depth-Image Coding**, PoLin Lai, Antonio Ortega, Univ. of Southern California (United States); Camilo Dorea, Peng Yin, Cristina Gomila, THOMSON Corp. Research (United States) . . . . . [7257-23]

Lunch/Exhibition Break . . . . . 12:20 to 1:30 pm

### SESSION 7

**Conv. Ctr. Room B2 . . . . . Wed. 1:30 to 3:30 pm**

#### Video Coding Standards

1:30 pm: **Low-complexity motion estimation for the Scalable Video Coding extension of H.264/AVC**, Livio Lima, Univ. degli Studi di Brescia (Italy); Daniele Alfonso, Luca Pezzoni, STMicroelectronics (Italy); Riccardo Leonardi, Univ. degli Studi di Brescia (Italy) . . . . . [7257-24]

1:50 pm: **Rate distortion cost modeling of skip mode and early skip mode selection for H.264**, Siwei Ma, Peking Univ. (China) . . . . . [7257-25]

2:10 pm: **A novel rate estimation model for mode decision of H.264/AVC**, Xin Zhao, Institute of Computing Technology (China); Jun Sun, Wen Gao, Peking Univ. (China) . . . . . [7257-26]

2:30 pm: **Intra prediction with 1D macroblock partitioning for image and video coding**, Joel Jung, Guillaume Laroche, Orange Labs. (France); Beatrice Pesquet, TELECOM ParisTech (France) . . . . . [7257-27]

2:50 pm: **A novel frame-level constant-distortion bit allocation for smooth H.v64 video quality**, Li Liu, Xinhua Zhuang, Univ. of Missouri (United States) . . . . . [7257-28]

3:10 pm: **An Adaptive Scan of High Frequency Subbands for Dyadic Intra Frame in MPEG4-AVC/H.264 Scalable Video Coding**, Zafar Shahid, Marc Chaumont, William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France) . . . . . [7257-29]

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

### SESSION 8

**Conv. Ctr. Room B2 . . . . . Wed. 4:00 to 4:40 pm**

#### Image Retrieval

4:00 pm: **Robust Image Retrieval using Multiview Scalable Vocabulary Trees**, David M. Chen, Sam S. Tsai, Vijay R. Chandrasekhar, Gabriel Takacs, Stanford Univ. (United States); Jatinder P. Singh, Deutsche Telekom Labs. (United States); Bernd Girod, Stanford Univ. (United States) . . . . . [7257-30]

4:20 pm: **Automatic image selection by means of a hierarchical scalable collection representation**, Pere Obrador, Nathan Moroney, Hewlett-Packard Co. (United States) . . . . . [7257-31]

## Thursday 22 January

*Sessions 9 and 11 run concurrently.*

### SESSION 9

**Conv. Ctr. Room B2 . . . . . .Thurs. 9:00 to 10:40 am**

#### Image Coding

9:00 am: **Lossy Compression of Floating Point High Dynamic Range Images Using JPEG2000**, Dominic Springer, Fraunhofer-Institut für Integrierte Schaltungen (Germany); Andre Kaup, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [7257-33]

9:20 am: **Structure learning and prediction for efficient image compression**, Xiwen Zhao, Zhihai He, Univ. of Missouri (United States). . . . . [7257-34]

9:40 am: **Coding with structurelets**, Zhihai He, Univ. of Missouri (United States) . . . . . [7257-35]

10:00 am: **Transform coding of image feature descriptors**, Vijay R. Chandrasekhar, Gabriel Takacs, David Chen, Sam Tsai, Jatinder Singth, Bernd Girod, Stanford Univ. (United States) . . . . . [7257-36]

10:20 am: **Multiple description image coding using several multiple description scalar quantizers**, Muhammad Majid, Charith Abhayaratne, The Univ. of Sheffield (United Kingdom) . . . . . [7257-37]

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

### SESSION 11

**Conv. Ctr. Room C2 . . . . . Thurs. 9:00 to 10:40 am**

#### Image Processing

9:00 am: **Curve matching in the framework of Riemannian geometry**, Yong Li, Robert L. Stevenson, Jiading Gai, Univ. of Notre Dame (United States) [7257-42]

9:20 am: **Enhancement tuning and control for high dynamic range images in multi-scale locally-adaptive contrast enhancement algorithms**, Sascha Cvetkovic, Johan Schirris, Bosch Security Systems (Netherlands); Peter H. N. de With, Univ. of Technology Eindhoven (Netherlands). . . . . [7257-43]

9:40 am: **Contour stencils for edge-adaptive image interpolation**, Pascal T. Getreuer, Univ. of California, Los Angeles (United States) . . . . . [7257-44]

10:00 am: **Adaptive boxcar/wavelet transform**, Osman G. Sezer, Yucel Altunbasak, Georgia Institute of Technology (United States) . . . . . [7257-45]

10:20 am: **Compression artifact reduction with adaptive bilateral filtering**, Ming Zhang, Bahadir Gunturk, Louisiana State Univ. (United States) . . [7257-46]

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

*Sessions 10 and 12 run concurrently.*

### SESSION 10

**Conv. Ctr. Room B2 . . . . . .Thurs. 11:10 am to 12:30 pm**

#### Distributed Source Coding

11:10 am: **An auto-regressive model for improved low-delay distributed video coding**, Yongbing Zhang, Debin Zhao, Harbin Institute of Technology (China); Siwei Ma, Peking Univ. (China); Ronggang Wang, France Telecom R&D Beijing (China); Wen Gao, Peking Univ. (China) . . . . . [7257-38]

11:30 am: **Content-Aware Packet Scheduling for Multi-Session Video Streaming over Mesh Networks**, Yongfei Zhang, BeiHang Univ. (China) and Univ. of Missouri (United States); Shiyin Qin, BeiHang Univ. (China); Xiwen Zhao, Zhihai He, Univ. of Missouri (United States) . . . . . [7257-39]

11:50 am: **Distributed rate allocation for multi-flow video delivery**, Jacob Chakareski, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Antonios Argyriou, Philips Research (Netherlands) . . . . . [7257-40]

12:10 pm: **Low-complexity Bayer-pattern video compression using distributed video coding**, Hu Chen, Mingzhe Sun, Eckehard Steinbach, Technische Univ. München (Germany) . . . . . [7257-41]

### SESSION 12

**Conv. Ctr. Room C2 . . . . . Thurs. 11:10 am to 12:30 pm**

#### Video Processing

Sessions 10 and 12 run concurrently.

11:10 am: **Shaking video stabilization with content completion**, Yi Peng, Qixiang Ye, Jianbin Jiao, Graduate Univ. of Chinese Academy of Sciences (China) . . . . . [7257-47]

11:30 am: **A trained filter de-interlacer based on complex classification**, Dmitry Znamenskiy, Philips Research (Netherlands); Marco Kruse, Univ. Karlsruhe (Germany) . . . . . [7257-48]

11:50 am: **Occlusion classifiers for picture rate conversion**, Chris Bartels, Technische Univ. Eindhoven (Netherlands); Gerard de Haan, Philips Research (Netherlands) . . . . . [7257-49]

12:10 pm: **Adaptive kernel filtering used in video processing**, Rasmus Engholm, Århus Univ. (Denmark); Henrik Karstoft, Engineering College of Aarhus (Denmark); Eva B. V. Jensen, Univ. of Aarhus (Denmark) . . . . . [7257-50]

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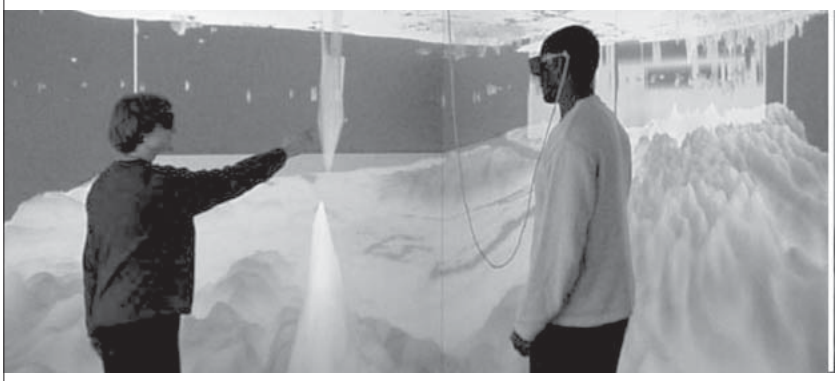

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