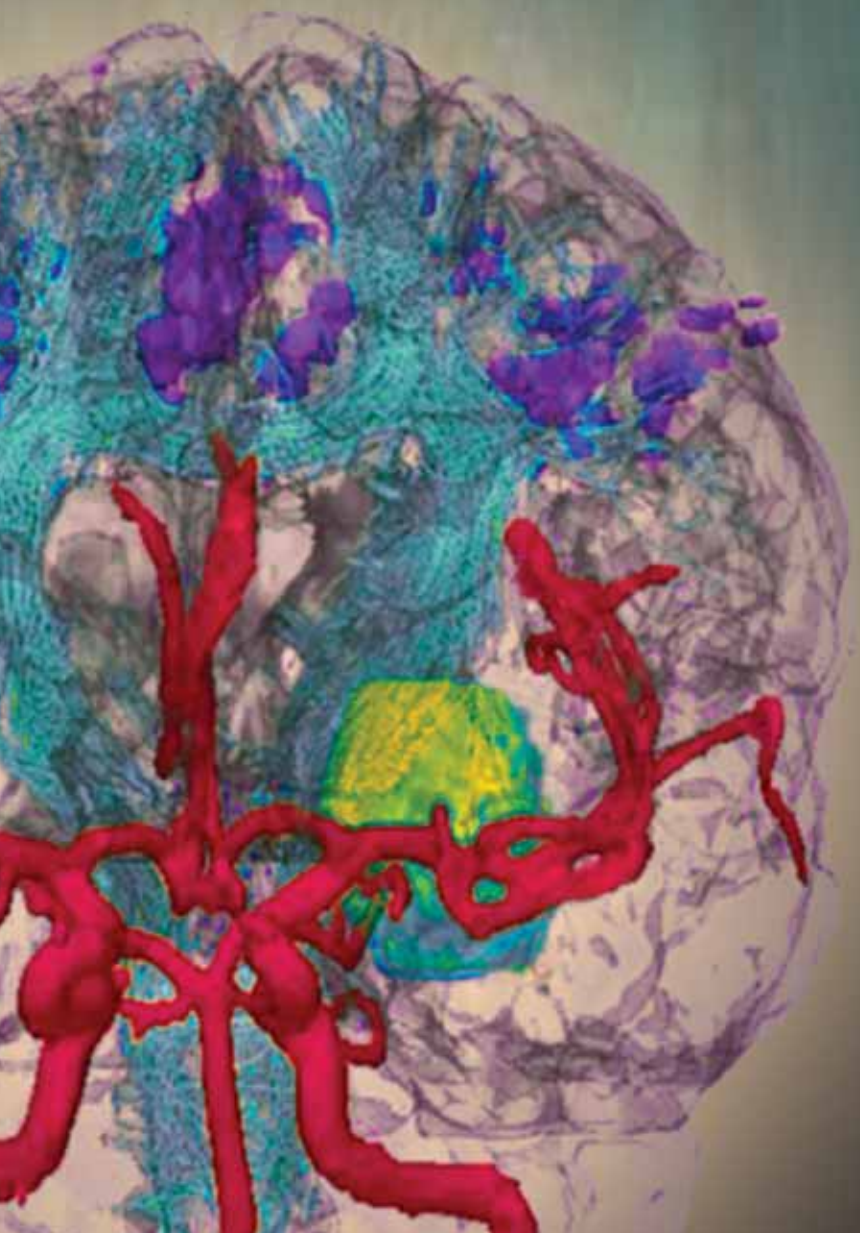
Technical Program/Summary Digest

Medical Imaging

An **SPIE** Event

11–16 February 2006

Town & Country Resort and Convention Center
San Diego, California USA



The International Society for Optical Engineering

Technical Program

Medical Imaging

An **SPIE** Event

11–16 February 2006 *Town & Country Resort and Convention Center • San Diego, California USA*

SPIE gratefully acknowledges the following cooperating organizations:

AAPM—American Association of Physicists in Medicine
APS—American Physiological Society
CARS—Computer Assisted Radiology and Surgery
FDA Center for Devices and Radiological Health
IS&T—The Society for Imaging Science and Technology
MIPS—Medical Image Perception Society
NEMA—National Electrical Manufacturers Association/Diagnostic Imaging and Therapy Systems Division
RSNA—Radiological Society of North America
SCAR—Society for Computer Applications in Radiology

Welcome to Medical Imaging 2006, the premier annual meeting on the scientific and technical aspects of medical imaging. This year's meeting features technical presentations on the most up-to-date research and development in the areas of image visualization, display and image-guided procedures; physics of medical imaging; physiology, function, and structure from medical images; image processing; PACS and imaging informatics; image perception, observer performance, and technology assessment; and ultrasonic imaging and signal processing. In the plenary presentation, Dr. Jonathan C. Newell, Department of Biomedical Engineering, Rensselaer Polytechnic Institute, will present'"Electrical Impedance Imaging: an Idea Whose Time May Soon Come" (see page 5). Included with your registration fee In-depth topical workshops will be offered in conjunction with several conferences and are free to all registered attendees. A set of professional development courses complements the symposium program. Most courses are held on the Saturday before the symposium to give you the opportunity to stay current with the latest technologies without interfering with any of the conference presentations. In addition to the scientific program, a product exhibition will again be part of the symposium. The exhibits offer interested delegates the opportunity to learn more about the latest components and systems related to medical imaging.

2006 Symposium Organizers

Eliot L. Siegel,
Univ. of Maryland

Elizabeth Krupinski,
The Univ. of Arizona

Milan Sonka,
The Univ. of Iowa

Image Credit: Multi-modal image visualization using 3D Slicer tools developed in the Laboratory of Mathematics in Imaging (http://lmi.bwh.harvard.edu) and the Surgical Planning Laboratory (http://spl.bwh.harvard.edu), Department of Radiology in collaboration with Department of Neurosurgery, Brigham and Women's Hospital, Harvard Medical School, Boston.

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

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
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Technical Conferences

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Courses

SC086 **Fundamentals of Medical Image Processing and Analysis** *(Analoui)* 8:30 am to 12:30 pm, $270 / $310

SC538 **Medical Image Analysis with ITK and Related Open-Source Software** *(Ibanez, Aylward, Cates, Lorensen, Ng, Jomier)* 8:30 am to 5:30 pm, $440 / $520

SC771 **Monte Carlo Simulation of Radiation Imaging Systems** *(Badano, Sempau, Flynn)* 8:30 am to 12:30 pm, $270 / $310

SC471 **Principles and Advancements in X-ray Computed Tomography** *(Hsieh)* 8:30 am to 12:30 pm, $335 / $375

SC701 **Statistical Image Processing of Magnetic Resonance Imaging** *(Lei)* 8:30 am to 12:30 pm, $270 / $310

SC356 **Digital Mammography and Computer-Aided Diagnosis** *(Karellas, Giger)* 1:30 to 5:30 pm, $270 / $310,

SC704 **Image-Guided Procedures and Computer Aided Surgery** *(Cleary, Galloway, Banovac)* 1:30 to 5:30 pm, $270 / $310

WS776 **Writing for Publication in Medical Imaging** *(Hanson)* 1:30 to 5:30 pm, $100 / $150

SC358 **X-Ray Detector Performance: Principles and Measurements using a Linear Systems Approach** *(Cunningham)* 1:30 to 5:30 pm, $270 / $310

STUDENTS: Save 50% on Courses

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Measures of Physical Performance for X-ray Imaging Systems *(6142),* 5:45 to 7:45 pm, Town & Country Room, p. 7

Evaluation of Image Segmentation *(6144),* 5:45 to 7:45 pm, Golden West Room, p. 7

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NIH One-on-One Forum, 9:00 to 11:30 am, Royal Palm I Room, p. 4

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Plenary Presentation

Electrical Impedance Imaging: an Idea Whose Time May Soon Come

Town & Country Room - Monday, 4:00 pm

Jonathan C. Newell, Ph.D., Rensselaer Polytechnic Institute

Jonathan C. Newell received B.S. and M.S. degrees in electrical engineering from Rensselaer Polytechnic Institute, and the Ph.D. degree in physiology from the Albany Medical College, in 1974. He then joined the faculty of Rensselaer Polytechnic Institute, where he is now Professor of Biomedical Engineering. He has also been a Professor of Physiology at the Albany Medical College. His recent research work has been the development of an adaptive system for electrical impedance imaging. In 1993, this work was awarded the Computerworld/ Smithsonian Award in Medicine. He is author or co-author of 85 papers in the peer-reviewed literature, and 50 abstracts and similar publications. He has presented his research work in eight countries.

Dr. Newell has been an Associate Editor for the IEEE Transactions on Medical Imaging, and serves as a reviewer of research papers and grants for the NIH, NSF and other US and international journals and agencies.

The formation of images of the body's electrical properties from measurements made at the surface is called Electrical Impedance Imaging. This usually requires attaching many electrodes to the skin in the area of interest, applying currents and measuring the resulting voltages. From these data, sophisticated reconstruction algorithms are applied to solve the inverse problem, and report the complex conductivity in the volume enclosed by the electrodes. This technology has several advantages over other imaging techniques, and several important limitations. It examines tissue conductivity and permittivity over a potentially wide range of temporal frequencies, typically between a few hundred Hz to above 1 MHz. When many frequencies are studied together, the term Impedance Spectroscopy has been used. These electrical properties, which may contain diagnostic information, are not assessed by other imaging modalities. For example, the impedance of breast tumors differs by a factor of 7-10 from that of normal breasts. Impedance images showing ventilation of the lungs, and blood volume changes in the heart and lungs, can be displayed continuously at the bedside of the critically ill, allowing risk-free continuous monitoring.

After 20 years of development, there remain a myriad of unanswered questions. There are theoretical questions about how to address the ill-posed non-linear reconstruction problem in the presence of the kinds and levels of noise that actually exist. There are practical questions about the number of electrodes that can be built and applied to different regions, and the trade-off between speed, complexity and noise levels in the electronics and electrode connections. There are clinical questions about the indications for this imaging technology, and ultimately its cost-effectiveness. Its cost could be low, but its effectiveness is yet to be demonstrated.

Poster Receptions

Grand Ballroom

Sunday/Monday Poster Session

(Visualization, Image-Guided Procedures, and Display; Physiology, Function, and Structure from Medical Imaging; Image Processing's first session; Ultrasonic Imaging and Signal Processing)

Authors are requested to put up their posters on Sunday from Noon to 1:30 pm.

Sunday Poster Viewing . . . . . 1:30 to 9:00 pm
Monday Poster Viewing . . . . . 7:15 am to 4:00 pm
Poster area will be closed from 4:00 to 5:30 pm for hotel catering staff to prepare for poster reception.

Monday Poster Reception . . . . . 5:30 to 7:00 pm
Authors in attendance to answer questions. Poster awards will be announced.

Extended Poster Viewing . . . . . 7:00 to 9:00 pm
Authors must remove their posters between 7:00 to 9:00 pm on Monday. Posters not removed will be discarded.

Tuesday/Wednesday Poster Session

(Physics of Medical Imaging; Image Processing's second session; PACS and Imaging Informatics; Image Perception, Observer Performance, and Technology Assessment)

Authors are requested to put up their posters on Tuesday beginning at 9:15 am.

Tuesday Poster Viewing 11:00 am to 9:00 pm
Wednesday Poster Viewing 7:30 am to 4:00 pm
Poster area will be closed from 4:00 to 5:30 pm for hotel catering staff to prepare for poster reception.

Wednesday Poster Reception . . . . . 5:30 to 7:00 pm
Authors in attendance to answer questions. Poster awards will be announced.

Extended Poster Viewing . . . . . 7:00 to 9:00 pm
Authors must remove their posters between 7:00 and 9:00 pm on Wednesday. Posters not removed will be discarded.

Papers not removed at the designated times will be considered UNWANTED and will be discarded. SPIE assumes no responsibility for posters left on the poster boards at the conclusion of poster sessions.

"Meet the NIH" Sessions

The Grants Process at NIH

Golden West Room · Sunday 5:45 to 7:45 pm

Moderator: **Lee A. Rosen, Ph.D.,** Scientific Review Administrator, Biomedical Imaging Technology Study Section, Center for Scientific Review, National Institutes of Health/HHS

The National Institutes of Health (NIH) is a major source of basic research support to academia and industry for the development of new technology for medical imaging. At the 2005 Medical Imaging meeting, representatives of five top funding institutes presented details of their areas of interest and new directions in imaging technology. However, to get support, one must prepare a grant application, and the artform of preparing such an application and how they are evaluated at NIH remains a mystery to many. The process of evaluation is called Peer Review and is the means by which NIH is able to evaluate and select the best science for funding, and in turn provide constructive feedback and guidance to those who are not successful. This planned session at the SPIE Medical Imaging meeting will focus on two points, the art of grantsmanship and how grant applications are evaluated through peer review. Members of the SPIE Medical Imaging community will provide thoughts and insights into the preparation of applications for NIH support, and an NIH representative who manages grant reviews for imaging technology will speak on the process of peer review. The objective of this workshop would be to provide some idea of the grantsmanship effort and what NIH study section reviewers are looking for in a successful grant application. Two speakers will be members of the academic environment who are also successful grantees with previous experience in review as permanent members study sections. In addition, for those in the private sector in small businesses, a third talk will involve the process by which they can also apply for grant support under the Small Business Innovative Research Program. Discussions will include what considerations are important in preparing a grant application, in amending one, and with new issues in human subjects and budgets.

Academic speakers will include John Boone, Ph.D., Professor and Vice Chair, Department of Radiology, Univ. of California, Davis, and Elizabeth Krupinski, Ph.D., Research Professor, Department of Radiology, Univ. of Arizona, speaking respectively on considerations of preparing an application for basic research and on revising an initially unsuccessful one. In addition, Robert Fagaly, Vice President, Tristan Technologies, San Diego, California, will speak on preparing applications for small business research support.

NIH One-on-One Forum

Royal Palm I Room · Monday 9:00 to 11:30 am

This session will provide an opportunity to meet with representatives of Center for Scientific Review and of at least three of the main imaging technology funding Institutes of NIH on a one on one basis to ask specific individual questions.

NCI Lung Image Database Consortium (LIDC): Open Meeting

San Diego Room · Sunday 6:45 to 7:45 pm

Academic Chairs: **Samuel G. Armato III,** Univ. of Chicago; **Geoffrey McLennan,** Univ. of Iowa

NCI Program staff: **Barbara Croft** and **Laurence P. Clarke,** Cancer Imaging Program, National Cancer Institute

Overview: The mission of the NCI supported Lung Image Database Consortium (LIDC) is sharing of lung images, especially low-dose helical CT scans of adults screened for lung cancer, and related technical and clinical data for development and testing of computer-aided diagnosis technology.

Principal Goals of the LIDC: To establish standard formats and processes for managing lung images and related technical and clinical data for use in the development and testing of computer-aided diagnostic (CAD) algorithms; and to develop an image database as a web-accessible international research resource for the development, training, and evaluation of CAD methods for lung cancer detection and diagnosis using helical CT.

LIDC Open Meeting Agenda: The agenda will include several presentations by members of the steering committee on the progress made by this consortium to be followed by an open forum that will solicit input from attendees of this meeting. The scope will include the results of a consensus process for the imaging protocol, collection of cases for this database, results of comparison of methods for the determination of the boundaries of nodules, development of a nodule visual library, and planned release of image data.

CT Colonography Database Workshop

Royal Palm I Room · Tuesday 5:45 to 6:45 pm

Description: CT colonography image databases are becoming available for research purposes. The purpose of this informal discussion group is to share ideas about annotating and making use of these databases. This workshop will be of great interest to both academic and commercial organizations developing and validating CT colonography computer-aided polyp detection (CAD) systems. A proposal for a CAD "bake-off" (competition) will also be discussed.

Poster Awards

Monday and Wednesday at 6:30 pm

Grand Ballroom Poster Area

This year's poster awards will be presented at 6:30 pm on Monday and Wednesday during the poster receptions. Award ribbons will be displayed on the winning posters at the poster receptions on those evenings. Each conference will recognize selected poster papers of exceptional quality at either the Cum Laude or Honorable Mention level. Winners will be chosen by members of individual conference program committees. In addition, cum laude poster award recipients will be recognized in the Proceedings of SPIE volumes. If authors agree, the first place winners' posters will be on display the following day outside the conference rooms.

Recognition levels:

Each conference will recognize a selected poster at the cum laude level in each poster session for the quality of work presented and for the presentation itself. A number of posters, limited to no more than five to ten percent of the best posters presented, will receive honorable mention.

Basis for selection:

1. Work should be of a standard of excellence as judged by the quality and quantity of results presented. It should include results that are both significant and new to the field of study. Conclusions should be well supported by the results, and relevant references should be cited.
2. Presentation should be well organized, clear, and concise. It should be self-contained, giving adequate background, concise results, and relevant references. Graphic design will be considered only to the extent that it contributes to the clarity of presentation.
3. A conference may give preference to first authors who are students or who are within five years of their terminal degrees.

The Michael B. Merickel

Best Student Paper Award

The symposium chairs will announce the best student paper for the Medical Imaging 2006 symposium at the Monday Plenary Presentation Session in the Town & Country Room.

Student Events

See page 8 for complete details on 3 great professional development opportunities for students.

- Publish in Medical Imaging
- Develop a career plan
- Network with Experts and Peers

Make Time to Visit the Exhibition

Medical Imaging

Town and Country Resort & Convention Center
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Stay up-to-date on industry trends at this FREE Exhibition!

The Medical Imaging 2006 exhibition includes imaging components, equipment and instruments offered by industry suppliers. Representatives will be on hand during exhibition hours to answer questions about the products and services being offered.

Exhibition Hours

Monday 13 February . . . . . 5:30 to 7:30 pm

Tuesday 14 February . . . . . 9:30 am to Noon;
1:00 to 4:00 pm

Wednesday 15 February . . . . . 9:30 am to Noon;
1:00 to 4:00 pm

Exhibition /Poster Reception
Grand Ballroom

Monday 13 February . . . . . 5:30 to 7:30 pm

The exhibition hall will be open Monday evening in conjunction with the poster session, to allow attendees specific exhibition and poster viewing time during the symposium. Take the opportunity to see the exhibits and talk with company representatives as well as review posters. Refreshments will be served.

Exhibiting companies as of 20 December 2006

Advanced Imaging Magazine, #95

Barco, #207

Biophotonics International, #102

Electro Optics Magazine, #93

Hamamatsu Corp., #205

Laser Focus World, #204

National Institute of Biomedical Imaging & Bioengineering, #104

RMD Instruments, LLC., #122

Society for Computer Applications in Radiology (SCAR), #94

Thales Components Corp., #203

All workshops are included with your registration fee.

Sunday

12 February

Visualization, Image-Guided Procedures, and Display
Conference 6141
San Diego Room · 5:45 to 6:45 pm

The Open-Source Software Movement: What's In It for You?

Organizers: **Kevin Cleary, PhD,** Georgetown University; **Terry S. Yoo, PhD,** National Library of Medicine; **Michael I. Miga,** Vanderbilt Univ.

NIH Program Officers: **John W. Haller,** National Institute of Biomedical Imaging and Bioengineering; **Keyvan Farahani, Laurence P. Clarke,** National Cancer Institute; **Peter Lyster,** National Institute of Biomedical Imaging and Bioengineering

This session will introduce the open source software movement and discuss what it means for researchers and other interested personnel. The goal of this session will be to educate the audience on some of the current issues in open source software development and stimulate discussion on how the research community can participate in open source software projects. We will also hear from some NIH representatives about their views on open source software and what NIH is doing to support this movement.

Please see the Special Events on page 4 for information on the NCI Lung Image Database Consortium (LIDC): Open Meeting following this workshop.

Physiology, Function, and Structure from Medical Images
Conference 6143
California Room · 5:45 to 7:45 pm

Cerebrovascular Modeling and Simulation

Speakers: **Fernando Vinuela,** Univ. of California/Los Angeles, **Alessandro F. Frangi,** Univ. Pompeu Fabra (Spain), **Charles A. Taylor,** Stanford Univ., **Juan R. Cebral,** George Mason Univ., **Juan Lasheras,** Univ. of California/San Diego, **Daniel. J. Valentino,** Univ. of California/Los Angeles

Cerebrovascular disease is a leading cause of death and permanent disability. Cerebrovascular anatomy, hemodynamics and biomechanics are all important in evaluating the extent and severity of disease, in planning treatment, monitoring progress, and evaluating outcomes. However, relatively little is known about the contribution and relative significance of these factors. Numerical simulations using imaging-based, patient-specific models of cerebrovascular disease are now the subject of intense research interest. It is important and timely to discuss the latest research results, understand their limitations, and identify the challenges that remain. This special workshop will bring together some of the leading researchers in this area to discuss the clinical rationale for cerebrovascular simulation, current segmentation and modeling techniques, different simulation techniques, validation and evaluation studies and analyses of error, and the computational challenges limiting research in this field.

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Tuesday

14 February

Physics of Medical Imaging
Conference 6142
Town & Country Room · 5:45 to 7:45 pm

Measures of Physical Performance for X-ray Imaging Systems

Chair: **Ehsan Samei,** Duke Univ.

Current methods to measure the resolution and noise characteristics of x-ray imaging systems are described by a panel of experts. The IEC standard method for measuring the MTF, NPS, and DQE will be summarized and practical suggestions made on how to apply the methods. The materials and software needed will be identified. Emerging issues with respect to temporal response and system response will be discussed. For computed tomography systems, methods to measure MTF and NPS will be described and illustrated.

PACS and Imaging Informatics
Conference 6145
California Room · 5:45 to 7:45 pm

DICOM

Moderator: **Robert Horn,** Agfa Corporation

The DICOM Workshop will include a brief overview of the major new material in the DICOM Standard. Because of interest from the imaging community, the following areas will then be discussed in more detail:

"Hanging protocols"

DICOM as an ISO Standard

Update on security additions for the Standard

ISO/DICOM Web Access to DICOM Objects (WADO)

DICOM encapsulation of PDF documents

There will be an opportunity to ask questions of the presenters and the other DICOM experts in attendance.

Attendees of the Workshop should have some familiarity with the DICOM Standard and may expect to learn about the newest developments from the major participants in the DICOM effort.

Image Processing
Conference 6144
Golden West Room · Tues. 5:45 to 7:45 pm

Evaluation of Image Segmentation

Speakers: **Jayaram K. Udupa,** Univ. of Pennsylvania; **Guido Gerig,** The Univ. of North Carolina System; **Simon K. Warfield,** Brigham and Women's Hospital

Image segmentation is one of the most crucial image processing operations that is required in almost any image analysis task. Since many other seemingly unrelated operations, such as image interpolation, filtering, registration, compression, display, and rendering, depend on the availability of object information for their effectiveness, they also depend, although somewhat indirectly, on segmentation. While, justifiably, a great deal of emphasis has been laid on the segmentation problem during the past 4 decades, the related issues of how to evaluate its solutions, and compare among the solutions in an exchangeable, standard manner that is acceptable to the scientific community at large have received far less attention.

In this workshop, there will be three presentations. Each speaker will present his perspective on the problems encountered in evaluating segmentation methods, the solutions as he sees fit, and the issues to be addressed as they pertain to the community at large. This will be followed by a discussion of several salient issues that have been considered by the speakers to be the most crucial in addressing segmentation evaluation.

Image Perception, Observer Performance, and Technology Assessment
Conference 6146
San Diego Room · 5:45 to 7:45 pm

How Experts Interpret Images: An Interactive Panel of Radiologists

Panelists: **Harold L. Kundel,** Univ. of Pennsylvania; **Eliot L. Siegel,** Veterans Affairs Medical Ctr.; **Ronald M. Summers,** National Institutes of Health; **Steven C. Horii,** Univ. of Pennsylvania

Image interpretation is at the core of radiology and is a critical component of medical imaging. It is important to understand how radiologists perceive and interpret images. However, the complexity involved makes it challenging to understand exactly how radiologists interpret images. In this workshop, a panel of radiologists will interpret a series of example cases, some of which will be difficult, with narration and discussion, to reveal the perception and thought process involved in searching for abnormalities and making a diagnosis. This exercise may provide insights to the understanding of the image-interpretation process and fresh perspectives to researchers who analyze images with a computer.

Thursday

16 February

Physics of Medical Imaging
Conference 6142
San Diego Room · 1:20 to 3:00 pm

Volumetric Reconstruction for X-ray CT

Speaker: **Andy Ziegler,** Philips GmbH

Methods to reconstruct 3D computed tomography (CT) image data from multi-slice and cone-beam x-ray CT systems are explained and compared. Experts will outline methods for those not familiar with image reconstruction, provide programming examples for those having some familiarity with software, and illustrate the performance achieved with specific solutions. Methods considered will include filtered-backprojection and interactive solutions suitable for cone-beam acquisitions with either circular or helical trajectories. Available public domain software and acceleration hardware will be identified.

Image Processing
Conference 6144
Golden West Room · Thurs. 1:20 to 3:00 pm

What Can We Expect from a Computer in the Interpretation of Medical Images?

Moderator: **Maryellen L. Giger,** The Univ. of Chicago

Current performance levels of CADe and CADx systems: without and with the human, D. Gur, Univ. of Pittsburgh; H. Chan, Univ. of Michigan

Opportunities for improved computer performance, R. M. Nishikawa, The Univ. of Chicago; J. Y. Lo, Duke Univ.

What actually do radiologists want?, H. L. Kundel, S. C. Horii, Univ. of Pennsylvania

Student Events at Medical Imaging

SPIE Student Services is sponsoring two unique professional development workshops and a social event open to all students at Medical Imaging 2006. These workshops will provide a strong background in two of the main concerns of young professionals: Publishing and Career Development. Taught by two leaders in the field, pre-registration is highly recommended for these courses.

Student membership in SPIE remains $20, provides online access to the *Journal of Biomedical Optics,* and can be obtained at the conference when you sign up for courses.

Combine these two workshops with a free informal networking event mixing experts, social time, and ice cream for a professional development home run. Take charge of your career.

STUDENTS:

Build a Career Plan for Medical Imaging Now

Writing for Publication in Medical Imaging

Saturday 11 February · 1:30 to 5:30 pm

This course teaches attendees the basic skills needed to create well-written scientific articles for publication in journals or proceedings. We discuss the structure of a paper and the functionality of its various parts. You will learn the standards of good technical writing, punctuation and grammar, and how to avoid common writing mistakes. We will discuss techniques for overcoming writer's block.

LEARNING OUTCOMES
This course will enable you to:
- plan and craft a well-written article for publication
- edit and revise your writing for consistent style
- improve the quality of your scientific writing
- avoid common errors in grammar and punctuation

INTENDED AUDIENCE
This course is intended for researchers, particularly students and those in their early career, who wish to improve their proficiency in writing scientific articles. Participants should have a basic understanding of the English language.

INSTRUCTOR
Kenneth Hanson has published over 140 papers and edited numerous proceedings. He was chair of the Image Processing conference for six years and chair of the Medical Imaging Symposium for three.

Course level: Intermediate
WS776 CEU .35
$100 SPIE Member / $150 USD Nonmember

STUDENTS:
Save 50% on Courses

Early Career Professional Development in Medical Imaging

Tuesday 14 February · 1:30 to 5:30 pm

This course provides attendees with strategies and ideas for navigating through the early years of Medical Imaging research in the academic environment. The course focuses on strategic career planning topics such as effective CV development, understanding the Promotion & Tenure process, resource negotiating tips, time management & organizational skills, and writing and winning research grants.

LEARNING OUTCOMES
This course will enable you to:
- develop a 5-year career plan in Medical Imaging research
- understand the role of personal styles in the negotiation process
- enhance your grantsmanship skills
- understand some of the unique challenges of doing research in academia
- become familiar with the the main sources of funding in medical imaging

INTENDED AUDIENCE
This material is intended for graduate students, post-doctoral students, residents and faculty members within five years of their first academic appointment. Women and minorities are especially encouraged to attend.

INSTRUCTOR
Elizabeth Krupinsk , PhD is a Research Professor of Radiology and Psychology and has been involved with Medical Imaging research in academic environments for over 15 years. Her main interests are in Medical Image Perception and Observer Performance in Radiology and Telemedicine applications. She has served as chair of the SPIE Medical Imaging Image Perception, Observer Performance & Technology Conference as well as Symposium Chair.

Course level: Introductory
WS757 CEU .35
$100 SPIE Member / $150 USD Nonmember

Ice Cream with the Experts

A Networking Event

Monday 13 February
7:00 pm to 8:00 pm

FREE, Advance sign-up required at Registration by Sunday 5:00 pm

Combine fun, food and networking at this engaging event open to all students. Join experts willing to share their accumulated wisdom on career paths within the optics and photonics industry. Advance sign-up is required at Registration by Sunday at 5:00 pm for ice cream. Among the experts in attendance will be:

Elizabeth Krupinski is a Research Professor at the University of Arizona with appointments in the Departments of Radiology and Psychology. She is the Associate Director of Evaluation for the Arizona Telemedicine Program. She received her undergraduate degree from Cornell University and her PhD from Temple University, both in Experimental Psychology. Her main interests are in medical image perception, the assessment of observer performance, and human factors issues in the radiology and telemedicine arenas. She is an ATA Board Member, co-editor of the Journal of Telemedicine & Telecare, and President of the Medical Image Perception Society.

Steven Horii did his undergraduate work at Johns Hopkins, then went on to NYU School of Medicine. He stayed on at NYU as a radiology resident and fellow, and joined the faculty after completing his fellowship. He spent four years at Georgetown University Medical Center before joining the radiology faculty at the University of Pennsylvania Medical Center. Dr. Horii is a Professor of Radiology and Clinical Director of the Medical Informatics Group.

Jiang Hsieh is a Chief Scientist in the Applied Science Laboratory of GE Healthcare Technologies. He has 20 years of experience in medical imaging. He holds over 120 US patents, has co-authored more than 120 articles, book chapters, and textbook. He taught the AAPM summer school, refresher courses at RSNA, short courses at IEEE Medical Imaging Conference, AAPM annual meeting, and SPIE Medical Imaging Conference. His research interests include tomographic reconstruction, CT image artifact reduction and correction, signal processing, image processing, and advanced CT applications.

Registration Hours

Grand Ballroom Foyer

Saturday 11 February . . . . 7:30 am to 4:00 pm
Sunday 12 February . . . . . 7:00 am to 5:00 pm
Monday 13 February . . . . . 7:15 am to 4:00 pm
Tuesday 14 February . . . . 7:30 am to 4:00 pm
Wednesday 15 February . . 7:30 am to 4:00 pm
Thursday 16 February . . . . 7:30 am to 1:30 pm

Exhibition Hours

Grand Ballroom

Monday 13 February . . . . . 5:30 to 7:00 pm
Tuesday 14 February . . . . . 9:30 am to Noon; 1:00 to 4:00 pm
Wednesday 15 February . . . 9:30 am to Noon; 1:00 to 4:00 pm

This exhibition includes imaging components, equipment and instruments offered by industry suppliers. Representatives will be on hand during exhibit hours to answer questions about the products and services being offered.

Speakers Check-In Room

Terrace Salon I-II Room

Saturday . . . . . 1:00 to 5:00 pm
Sunday through Wednesday . 7:30 am to 5:00 pm
Thursday . . . . . 7:30 am to 1:30 pm

Oral Presentations

SPIE will provide computers in all Medical Imaging conference rooms. Authors are required to check in at the Speakers Check-In Room, Terrace Salon I Room, by 5:00 pm of the day prior to presentation to submit oral presentations and confirm compatibility. Oral presentations are best presented in PowerPoint or Adobe Acrobat PDF formats. Presentations can be accepted on pen drive, CD-ROM, or directly from your laptop. Audiovisual questions can be emailed to AVStaff@SPIE.org.

Audio/Video/Digital Recording Policy

For copyright reasons, recordings of any kind are strictly prohibited without prior written consent of the presenter in any conference session, short course or of posters presented. Each presenter being taped must file a signed written consent form. Individuals not complying with this policy will be asked to leave a given session and asked to surrender their film or recording media. Consent forms are available at the SPIE Speakers Check-In Room.

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Breakfast Options

Coffee and pastries may be purchased for takeout at the Cinnamon Trolley Wagon in the Royal Palm Court from 7:00 to 9:00 am. Attendees may also try the Terrace Cafe, which serves a full breakfast, or the Sunshine Deli for other snack items. The Terrace Cafe is open at 6:00 am; the Sunshine Deli is open starting at 6:30 am and the Trellises opens at 7:00 am.

SPIE-Hosted Lunches

SPIE-hosted lunches will be served Sunday through Thursday from 12:10 pm to 1:00 pm poolside at the Terrace Pavilion. Should inclement weather prevent outdoor lunches, they will be served downstairs. Complimentary tickets for lunches will be included in registration packets for full-conference registrants. Student attendees will receive a complimentary lunch ticket for Monday, Tuesday, and Wednesday. Exhibitors and students may purchase lunch tickets from the cashier at the SPIE Registration Desk if tickets are available.

Attendees need to make their own lunch arrangements on Saturday.

Coffee Breaks

Coffee will be served at 9:30 am to 10:15 am; 3:00 pm to 3:30 pm each Saturday through Wednesday and 9:30 am to 10:15 am on Thursday. Please check the individual technical conference listings for exact time and location.

Desserts

Desserts will be served in the Exhibition Hall, Grand Ballroom on Tuesday and Wednesday at 3:00 pm. Complimentary tickets for the dessert snacks will be included in the attendee registration packets.

Internet Access

Terrace Salon III Room

Sunday . . . . . Noon to 6:00 pm
Monday through Wednesday . 7:00 am to 6:00 pm
Thursday . . . . . 7:00 am to 1:00 pm

The Terrace Salon III Room will be equipped with stations so attendees may access their internet e-mail during the conference. There will be a 10-minute time limit for each internet session.

Wireless Internet Access

Guest rooms at The San Diego Town & Country Resort and Convention Center are equipped with high-speed wireless Internet access, available at a special discounted rate of $4.95 for 24 hours for attendees to the Medical Imaging Symposium. Laptops will need an appropriate wireless card and access is available in all guest room areas. Please contact internet call center at Ext. 1234 in order to get this discounted rate. You will need a credit card for this access. Note: WiFi service is not available in or near meeting rooms.

Properly secure your computer before accessing the Public Wireless network. Failure to do so may allow unauthorized access to your laptop.

Messages for Attendees

San Diego Town & Country Resort and Convention Center phone number:
619 908 5040

The SPIE Message Board will be located near the Registration Desk. Messages will be taken during registration hours Saturday through Thursday. To leave a message, call the hotel and ask the hotel operator for the SPIE Registration Desk.

SPIE Marketplace

Grand Ballroom Foyer

Open during registration hours

Stop by the SPIE Marketplace to browse SPIE's newest publications and take advantage of special meeting prices. The SPIE Marketplace is your source for a wide range of scholarly books, tutorials, proceedings and CD-ROMs for professionals and educators in the fields of optics, photonics and imaging.

Child Care

Marion's Child Care, 1-888-891-5029,
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SPIE does not imply an endorsement or recommendation of this service. It is provided on an "information-only" basis for your further analysis and decision. Other services may be available.

Hertz®

Hertz Car Rental is the official car rental agency for this Symposium. To reserve a car, identify yourself as a **Medical Imaging Conference attendee** using the **Hertz Meeting Code CV# 029B0009.**

In the United States call 1-800-654-2240.

Shuttle from San Diego Airport

San Diego International Airport is six miles from the Town and Country Resort. Cloud Nine Shuttle bus service to & from the Town & Country Resort is $11.50 per person one-way (prices subject to change). On arrival at the airport, after baggage claim, take the Skybridge to the Island "Shuttles for Hire" and ask the attendant in the blue jacket for assistance boarding. Reservations not required for transportation to the Town & Country Resort, but are required for transportation back to the airport. Cloud 9 Shuttle recommends a pickup time of at least 2 hours prior to flight departure time. Method of payment can be cash or credit card, but no checks. There is no roundtrip discount when traveling to/from hotels. Shuttle stops enroute to load/unload passengers. To book online www.cloud9shuttle.com or call 1-858-974-8885.

Taxi from San Diego Airport

Taxi service between the airport and the Town & Country Resort is approximately $23 one-way.

Parking

Complimentary outdoor self-parking has been arranged at the hotel for Medical Imaging attendees. Be sure to identify yourself as a Medical Imaging 2006 attendee at check in to receive the complimentary parking. Your attendee badge can be shown when exiting the parking lot to receive the complimentary parking.

Local Attractions

Attendees wishing to arrange for tours/sightseeing for themselves, or traveling guests, may contact the hotel concierge prior to the meeting to make arrangements
concierge@towncountry.com

Concierge services are offered on-site in the main lobby. The hotel will also provide a special Concierge Services desk near SPIE registration for the convenience of SPIE's attendees, Sunday-Wednesday from 8:30 to 10:00 am.

Services include:

- Discount tickets to San Diego Zoo and Seaworld
- Discount rates for Riverwalk Golf Course
- Priority seating at Hotel Restaurants and off property restaurants
- San Diego City, Mexico, wine tours or harbor excursions
- Public Transit Information, local driving directions/maps

San Diego Trolley/Light Rail

(Metropolitan Transit System)

The San Diego Trolley, i.e. the light rail, is referred to as the "moving landmark" and is a fun way to get around, serving a wide area from the International Border, to Centre City's shopping harbor, Mission Valley, Fashion Valley, Old Town, Downtown including the Gas Lamp Quarter, etc. Fares are based on the trip distance. The fare ranges from $1.25 to $3.00 depending on how many stations are traveled (fares are subject to change). The closest trolley stop is located between the Hotel and the Fashion Valley Mall, handy to Old Town, Downtown and even Tijuana. Check the website www.sdcommute.com for schedule information.

Fashion Valley Mall

Located directly behind the hotel. Two level outdoor garden center featuring over 300 specialty shops and restaurants and an 18 screen movie complex. It is the largest shopping area in San Diego!

Old Town

Take the Trolley or Hotel Shuttle to the founding site of San Diego with excellent Mexican dining and shopping.

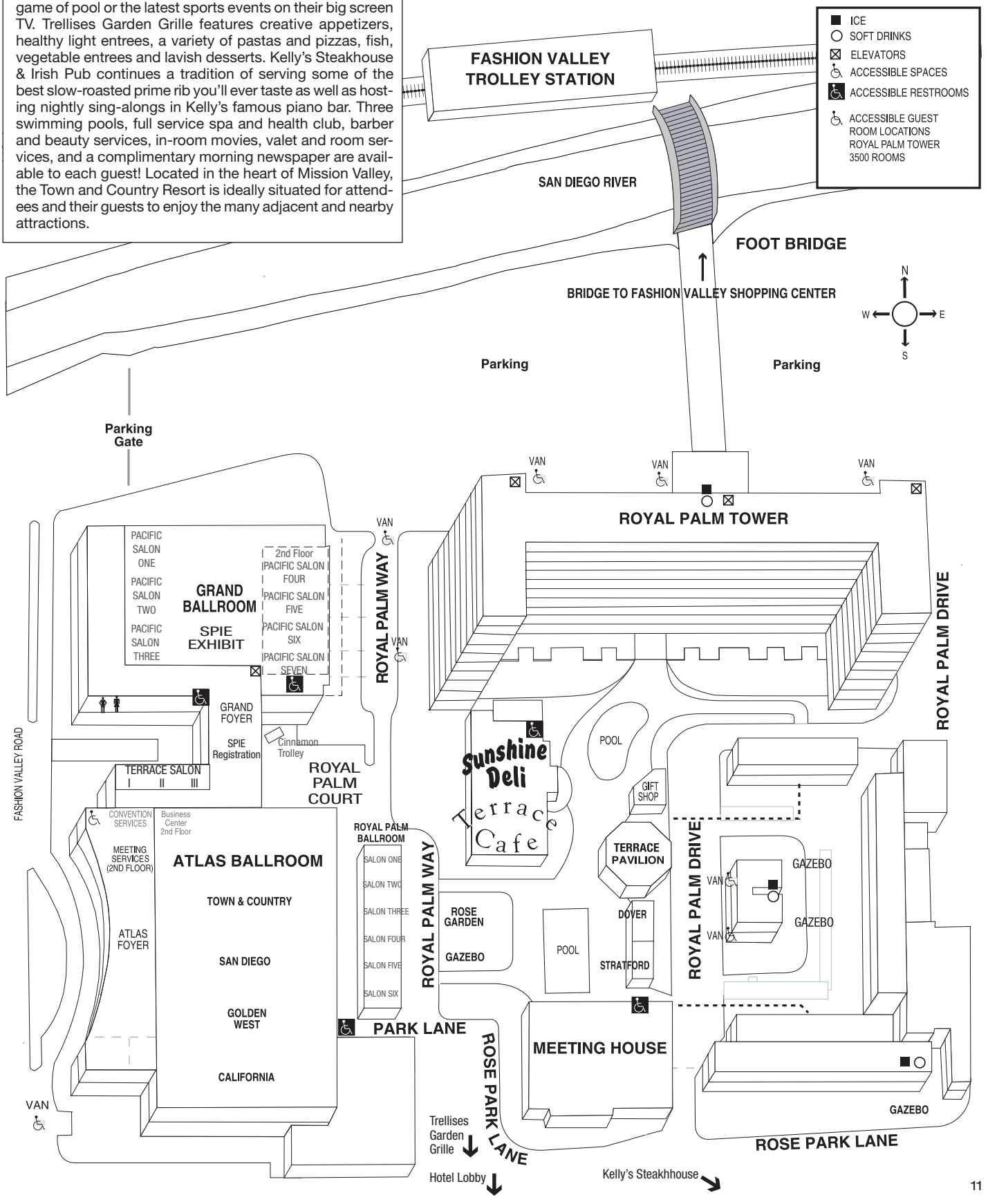
Horton Plaza/Gas Lamp Quarter

Take the Trolley to downtown San Diego and enjoy shopping at Horton Plaza and/or the exciting nightlife of excellent restaurants and clubs of the Gas Lamp District.

Seaport Village

Situated on 22 acres of parkland at the water's edge, over 60 shops, galleries, and boutiques along with restaurants are found in this unique village.

The Town & Country Resort and Convention Center features 1,000 guest rooms spread over 40 lushly landscaped acres in San Diego's Mission Valley. The hotel has five restaurants providing diverse dining experiences and several lounges offer a relaxing retreat from the day's activities. For casual dining, try the Terrace Café or for a quick bite visit the Sunshine Deli. You'll enjoy Charlie's for fun eats, a game of pool or the latest sports events on their big screen TV. Trellises Garden Grille features creative appetizers, healthy light entrees, a variety of pastas and pizzas, fish, vegetable entrees and lavish desserts. Kelly's Steakhouse & Irish Pub continues a tradition of serving some of the best slow-roasted prime rib you'll ever taste as well as hosting nightly sing-alongs in Kelly's famous piano bar. Three swimming pools, full service spa and health club, barber and beauty services, in-room movies, valet and room services, and a complimentary morning newspaper are available to each guest! Located in the heart of Mission Valley, the Town and Country Resort is ideally situated for attendees and their guests to enjoy the many adjacent and nearby attractions.



Conference 6141

ROOM: San Diego

Sunday-Tuesday 12-14 Feb. 2006
Proceedings of SPIE Vol. 6141

Visualization, Image-Guided Procedures, and Display

Conference Chairs: **Kevin R. Cleary**, Georgetown Univ.; **Robert L. Galloway, Jr.**, Vanderbilt Univ.

Program Committee: **Wolfgang Birkfellner**, Univ. Wien (Austria); **Hartwig R. Blume**, Planar Systems, Inc./Retired; **George J. Grevera**, St. Joseph's Univ.; **Steven L. Hartmann**, Medtronic Navigation; **David R. Haynor**, Univ. of Washington; **David R. Holmes III**, Mayo Clinic and Foundation; **Pierre Jannin**, Univ. de Rennes I Medical School (France); **Michael I. Miga**, Vanderbilt Univ.; **Terence M. Peters**, Robarts Research Institute (Canada); **Jong Beom Ra**, Korea Advanced Institute of Science and Technology (South Korea); **Frank Sauer**, Siemens Corporate Research; **Jayaram K. Udupa**, Univ. of Pennsylvania; **Jay B. West**, Accuray Inc.

✔Posters for this conference will be on display Sunday and Monday, 12-13 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Monday evening from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

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Conference 6142

ROOM: Town & Country

Sunday-Thursday 12-16 Feb. 2006
Proceedings of SPIE Vol. 6142

Physics of Medical Imaging

Conference Chairs: **Michael J. Flynn**, Henry Ford Health System; **Jiang Hsieh**, GE Healthcare

Program Committee: **Aldo Badano**, U.S. Food and Drug Administration; **Harrison H. Barrett**, The Univ. of Arizona; **Jeffrey A. Fessler**, Univ. of Michigan; **Thomas Flohr**, Siemens AG (Germany); **Robert M. Nishikawa**, The Univ. of Chicago; **Michael Overdick**, Philips Research Labs. (Germany); **John A. Rowlands**, Univ. of Toronto (Canada); **Ehsan Samei**, Duke Univ.; **Richard L. Van Metter**, Eastman Kodak Co.; **Bruce R. Whiting**, Washington Univ. in St. Louis; **Wei Zhao**, Stony Brook Univ.

✔Posters for this conference will be on display Tuesday and Wednesday, 14-15 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Wednesday evening from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

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Conference 6143

ROOM: California

Sunday-Tuesday 12-14 Feb. 2006
Proceedings of SPIE Vol. 6143

Physiology, Function, and Structure from Medical Images

Conference Chairs: **Armando Manduca**, Mayo Clinic; **Amir A. Amini**, Washington Univ. in St. Louis

Program Committee: **Juan R. Cebral**, George Mason Univ.; **Anne V. Clough**, Marquette Univ.; **Alexander Hartov**, Dartmouth College; **Andreas H. Hielscher**, Columbia Univ.; **William E. Higgins**, The Pennsylvania State Univ.; **Eric A. Hoffman**, The Univ. of Iowa; **Xiaoping P. Hu**, Emory Univ. School of Medicine; **Erik L. Ritman**, Mayo Clinic and Foundation; **Ronald M. Summers**, National Institutes of Health; **Felix W. Wehrli**, Univ. of Pennsylvania

✔Posters for this conference will be on display Sunday and Monday, 12-13 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Monday evening from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

(ST) = Short Talk–Presenters have been selected to prepare short ten-minute presentations.

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Conference 6147

ROOM: Golden West

Sunday 12 Feb. 2006
Proceedings of SPIE Vol. 6147

Ultrasonic Imaging and Signal Processing

Conference Chairs: **Stanislav Emelianov**, The Univ. of Texas at Austin; **William F. Walker**, Univ. of Virginia

Program Committee: **Jeffrey C. Bamber**, Institute of Cancer Research (United Kingdom); **Michael F. Insana**, Univ. of Illinois; **Jørgen A. Jensen**, Danmarks Tekniske Univ. (Denmark); **Kathryn R. Nightingale**, Duke Univ.; **K. K. Shung**, Univ. of Southern California; **Kai E. Thomenius**, General Electric Co.; **David H. R. Vilkomerson**, DVX LLC

✔Posters for this conference will be on display Sunday and Monday, 12-13 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Monday evening from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

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Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 1

RM: San Diego . . . . Sun. 8:00 to 9:40 am

Augmented Reality and Virtual Colonscopy and Endoscopy

Chair: **Wolfgang Birkfellner**, Medizinische Univ. Wien (Austria)

8:00 am: **Image-based rendering method for mapping endoscopic video onto CT-based endoluminal views,** L. Rai, W. E. Higgins, The Pennsylvania State Univ. . . [6141-01]

8:20 am: **Dual modality virtual colonoscopy workstation: design, implementation, and preliminary evaluation,** D. Chen, M. Meissner, Viatronix Inc. . . . . [6141-02]

8:40 am: **Development of a navigation system for endoluminal brachytherapy in human lungs,** I. Wegner, M. Vetter, M. Schoebinger, I. Wolf, H. Meinzer, Deutsches Krebsforschungszentrum (Germany) . . . . . [6141-03]

9:00 am: **Augmented reality visualization for thoracoscopic spine surgery,** F. Sauer, S. Vogt, A. Khamene, Siemens Corporate Research; S. Heining, E. Euler, Ludwig-Maximilians-Univ. München (Germany); K. Zuerl, M. Schneberger, Advanced Realtime Tracking GmbH (Germany); W. Mutschler, Ludwig-Maximilians-Univ. München (Germany) . . [6141-04]

9:20 am: **Simulation of guide-wire navigation in complex vascular structures,** V. Guilloux, P. Haigron, C. Goeksu, C. Kulik, A. Lucas, Univ. de Rennes I (France) . . . . . [6141-05]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 1

RM: Town & Country Sun. 8:00 to 9:40 am

Keynote Session

Chair: **Michael J. Flynn**, Henry Ford Health System

Keynote (Presentation Only)

8:00 am: **Imaging in medicine: X-ray computed tomography,** E. L. Siegel, Veterans Affairs Medical Ctr. . . . . [6142-01]

Keynote (Presentation Only)

8:30 am: **Imaging in medicine: radiography,** J. T. Dobbins III, Duke Univ. . . . . [6142-02]

9:00 am: **Low-cost digital radiographic imaging systems: the x-ray light valve,** J. A. Rowlands, I. Koprinarov, C. A. Webster, K. Schad, P. Oakham, S. Germann, Sunnybrook and Women's Health Sciences Ctr. (Canada) . . . . . [6142-03]

9:20 am: **A multi-beam x-ray imaging system based on carbon nanotube field emitters,** J. Zhang, G. Yang, Y. Lee, The Univ. of North Carolina at Chapel Hill; Y. Cheng, B. Gao, Q. Qiu, Xintek, Inc.; J. Lu, O. Zhou, The Univ. of North Carolina at Chapel Hill . . . . . [6142-04]

Coffee Break . . . . . 9:40 to 10:10 am

6142 continues on page 14

Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 1

RM: California . . . . Sun. 8:00 to 9:40 am

Small Animal Imaging

Chair: **Anne V. Clough**, Marquette Univ.

8:00 am: **Structure and function relationship of Zebrafish embryonic heart from confocal microscopy images,** A. N. Moghaddam, A. Forouhar, M. Liebling, California Institute of Technology; H. Tsai, National Taiwan Univ. (Taiwan); M. Gharib, California Institute of Technology . . . . . [6143-01]

8:20 am: **Quantification of adipose tissue in a rodent model of obesity,** D. H. Johnson, C. A. Flask, D. P. Wan, P. R. Ernsberger, D. L. Wilson, Case Western Reserve Univ. . . . . [6143-02]

8:40 am: **Precise imaging of small animals using a dual-head microPET scanner,** C. Kao, E. Y. Sidky, X. Pan, The Univ. of Chicago . . . . . [6143-03]

9:00 am: **Optimization of retrospectively respiratory-gated volume micro-CT techniques for imaging mice in less than one minute,** N. L. Ford, S. Detombe, A. Wheatley, D. W. Holdsworth, M. Drangova, Robarts Research Institute (Canada) . . . . . [6143-04]

9:20 am: **In vivo micro-CT imaging of the murine lung via a computer controlled intermittent iso-pressure breath hold (IIBH) technique,** E. Namati, D. Chon, J. Thiesse, G. McLennan, J. Sieren, A. Ross, E. Hoffman, Univ. of Iowa Hospitals and Clinics . . . . . [6143-05]

Coffee Break . . . . . 9:40 to 10:10 am

6143 continues on page 14

Conference 6147 *continued*

Ultrasonic Imaging and Signal Processing

ROOM: Golden West

SESSION 1

RM: Golden West . . Sun. 8:00 to 9:45 am

3D Ultrasound Imaging

Chair: **William F. Walker**, Univ. of Virginia

8:00 am: **Evaluation of image compression for computer-aided diagnosis of breast tumors in 3D sonography,** W. Chen, National Dong Hwa Univ. (Taiwan); Y. Huang, C. Tao, Tunghai Univ. (Taiwan) . . . . . [6147-01]

8:15 am: **Advanced volume rendering algorithm for ultrasound real-time 3D: integrating pre-integration into shear-image order algorithm,** R. A. Managuli, Hitachi Medical Systems of America; E. Kim, K. Karadayi, Y. Kim, Univ. of Washington . . . . . [6147-02]

8:30 am: **Real-time transrectal 3D ultrasound using synthetic aperture,** J. Yen, N. M. Daher, C. Seo, Univ. of Southern California . . . . . [6147-03]

8:45 am: **High resolution 3D prostate ultrasound imaging,** Y. Li, J. A. Hossack, Univ. of Virginia . . . . . [6147-04]

9:00 am: **Breast tumor angiogenesis analysis using 3D power Doppler ultrasound,** R. Chang, S. Huang, Y. Lee, National Chung Cheng Univ. (Taiwan); D. Chen, Changhua Christian Hospital (Taiwan); W. K. Moon, Seoul National Univ. (Taiwan) . . . . [6147-05]

9:15 am: **Multiview 3D reconstruction with volumetric registration in a freehand ultrasound imaging system,** H. Yu, M. S. Pattichis, M. B. Goens, The Univ. of New Mexico . . [6147-06]

9:30 am: **Boundary detection in 3D ultrasound reconstruction using nearest neighbor map,** V. Mitra, P. C. Pedersen, Worcester Polytechnic Institute; J. Dey, Univ. of Massachusetts Medical School . . . . . [6147-07]

Coffee Break . . . . . 9:45 to 10:10 am

6147 continues on page 14

Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 2

RM: San Diego Sun. 10:10 am to 12:10 pm

Visualization and Rendering

Chairs: **George J. Grevera**, St. Joseph's Univ.; **Jayaram K. Udupa**, Univ. of Pennsylvania

10:10 am: **A novel visualization method for the ribs within chest volume data,** A. P. Kiraly, S. Qing, H. Shen, Siemens Corporate Research . . . . . [6141-06]

10:30 am: **Visualizing the beating heart: interactive direct volume rendering of high-resolution CT time series using standard PC hardware,** H. Lehmann, G. Kiefer, O. Ecabert, J. Weese, Philips Research Labs. (Germany) . . . . . [6141-07]

10:50 am: **Fast maximum intensity projection with 3D nonlinear wavelets,** M. Héritier, R. Noumeir, École de Technologie Supérieure (Canada) . . . . . [6141-08]

11:10 am: **Representation and visualization of variability in a 3D anatomical atlas using the kidney as an example,** S. B. Hacker, H. Handels, Univ. Medical Ctr. Hamburg-Eppendorf (Germany) . . . . . [6141-09]

11:30 am: **Visualization of tumor-influenced 3D lung dynamics,** A. P. Santhanam, C. M. Fidopiastis, K. Langen, P. A. Kupelian, S. Meeks, College of Optics and Photonics/Univ. of Central Florida; L. Davis, Tirrion Technologies LLC; J. P. Rolland, College of Optics and Photonics/Univ. of Central Florida . . . . . [6141-10]

11:50 am: **Surface reconstruction from orthogonal contours,** H. Zhang, Univ. of Medicine and Dentistry of New Jersey and Robert Wood Johnson Medical School; J. L. Nosher, P. J. Yim, Univ. of Medicine and Dentistry of New Jersey . . . . . [6141-11]

Lunch Break . . . . . 12:10 to 1:20 pm

6141 continues on page 15

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 2

RM: Town & Country Sun. 10:10 am to 12:10 pm

Mammography

Chair: **Robert M. Nishikawa**, The Univ. of Chicago

10:10 am: **Applying the European protocol for the quality control of the physical and technical aspects of mammography screening to digital systems,** R. VanMetter, M. D. Heath, L. M. Fletcher-Heath, Eastman Kodak Co. . . . . [6142-108]

10:30 am: **Comparison of software and human observers in reading images of the CDMAM test object to assess digital mammography systems,** K. C. Young, J. J. Cook, J. M. Oduko, The Royal Surrey County Hospital NHS Trust (United Kingdom); H. T. Bosmans, Univ. Ziekenhuizen Leuven (Belgium) . . . . . [6142-06]

10:50 am: **Anatomically adaptable automatic exposure control (AEC) for amorphous selenium (a-Se) full field digital mammography (FFDM) system,** M. J. Varjonen, P. Strommer, Planmed Oy (Finland) . . . . . [6142-07]

11:10 am: **Investigation of minimum dose requirements for a dedicated mammotomography system with unique arbitrary orbit capability and quasi-monochromatic beam,** R. L. McKinley, M. P. Tornai, Duke Univ. . . . . [6142-08]

11:30 am: **Comparison of polychromatic and monochromatic x-rays for imaging,** M. Hoheisel, Siemens Medical Solutions (Germany); R. Lawaczeck, H. Pietsch, Schering AG (Germany) . . . . . [6142-09]

11:50 am: **Optimization of operating conditions in photon-counting multi-slit mammography based on Si-strip detectors,** M. C. Åslund, Kungliga Tekniska Högskolan (Sweden) and Sectra Mamea AB (Sweden); B. Cederström, Kungliga Tekniska Högskolan (Sweden); M. Lundqvist, Sectra Mamea AB (Sweden); M. E. Danielsson, Sectra Mamea AB (Sweden) and Kungliga Tekniska Högskolan (Sweden) . . . . . [6142-10]

Lunch Break . . . . . 12:10 to 1:20 pm

6142 continues on page 15

Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 2

RM: California Sun. 10:10 am to 12:10 pm

Cardiovascular Imaging

Chair: **Amir A. Amini**, Washington Univ. in St. Louis

Keynote

10:10 am: **Electrocardiographic imaging (ECGI): a new noninvasive imaging modality for cardiac electrophysiology and arrhythmia,** Y. Rudy, Washintgon Univ. in St. Louis . . . . . [6143-06]

11:10 am: **Analysis of four-dimensional cardiac ventricular magnetic resonance images using statistical models of ventricular shape and cardiac motion,** H. Zhang, N. Walker, S. C. Mitchell, M. Thomas, A. Wahle, T. Scholz, M. Sonka, The Univ. of Iowa . . . . . [6143-07]

11:30 am: **Quantitative analysis of vascular dimension and plaque composition in coronary multidetector computed tomography images,** M. E. Olszewski, A. Wahle, The Univ. of Iowa; M. Vembar, L. Ciancibello, Philips Medical Systems N.A.; A. Kerner, R. Beyar, E. Ghersin, Rambam Medical Ctr. (Israel); K. Subramanyan, Philips Medical Systems N.A.; M. Sonka, The Univ. of Iowa . . . . . [6143-08]

11:50 am: **Using Doppler intravascular ultrasound (IVUS) to analyze adventitial vasa vasorum distribution: considerations and recommendations,** A. Redwood, Wesleyan College; D. R. Holmes III, E. Yang, A. Lerman, R. A. Robb, Mayo Clinic . . . . . [6143-09]

Lunch Break . . . . . 12:10 to 1:20 pm

6143 continues on page 15

Conference 6147 *continued*

Ultrasonic Imaging and Signal Processing

ROOM: Golden West

SESSION 2

RM: Golden West Sun. 10:10 to 11:55 am

Beamforming and Image Processing

Chair: **Chris L. de Korte**, Univ. Medisch Ctr. St. Radboud (Netherlands)

10:10 am: **Automatic time gain compensation and dynamic range control in ultrasound imaging systems,** D. Lee, Y. S. Kim, J. B. Ra, Korea Advanced Institute of Science and Technology (South Korea)[6147-08]

10:25 am: **An iterative, wavelet-based deconvolution algorithm for the restoration of ultrasound images in an EM framework,** J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, A. H. Gee, Univ. of Cambridge (United Kingdom) . . . . . [6147-09]

10:40 am: **Beamforming and hardware design for a multichannel front-end integrated circuit for real-time 3D catheter-based ultrasonic imaging,** I. O. Wygant, Stanford Univ.; M. Karaman, Isik Univ. (Turkey); O. Oralkan, B. T. Khuri-Yakub, Stanford Univ. . . . . [6147-36]

10:55 am: **The sonic window: second generation results,** W. F. Walker, M. I. Fuller, E. V. Brush, M. D. Eames, K. Owen, Univ. of Virginia; T. N. Blalock, J. A. Hossack, Univ. of Virginia and PocketSonics, Inc. . . . . [6147-11]

11:10 am: **Efficient array beamformer using spatial filtering for ultrasound B-mode imaging,** K. Kim, J. Liu, M. F. Insana, Univ. of Illinois at Urbana-Champaign . . . . . [6147-12]

11:25 am: **Recursive delay calculation unit for parametric beamformer,** S. Nikolov, J. A. Jensen, B. G. Tomov, Danmarks Tekniske Univ. (Denmark) . . . . . [6147-13]

11:40 am: **Breaking the resolution limit: an exciting experimental result,** F. Simonetti, Imperial College London (United Kingdom) . . . . . [6147-14]

Lunch Break . . . 11:55 am to 1:20 pm

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Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 3

RM: San Diego . . . . Sun. 1:20 to 3:00 pm

Registration and Segmentation

Chair: **Jong B. Ra**, Korea Advanced Institute of Science and Technology (South Korea)

1:20 pm: **Robust surface registration using salient anatomical features in image-guided liver surgery,** L. W. Clements, Vanderbilt Univ.; D. M. Cash, Univ. College London (United Kingdom); W. C. Chapman, Washington Univ. in St Louis; R. L. Galloway, Jr., M. I. Miga, Vanderbilt Univ. . . . . [6141-12]

1:40 pm: **A realistic simulation framework for assessing deformable slice-to-volume (CT-fluoroscopy/CT) registration,** Z. R. Yaniv, Georgetown Univ. Medical Ctr.; R. Stenzel, Georgetown Univ. Medical Ctr. and Univ. of Karlsruhe (Germany); K. R. Cleary, Georgetown Univ.; F. Banovac, Georgetown Univ. and Georgetown Univ. Hospital . [6141-13]

2:00 pm: **Shape-based segmentation and visualization technique for evaluation of atherosclerotic plaque in coronary artery disease (CAD),** D. Rinck, S. Krueger, Siemens Medical Solutions (Germany); G. Schäfer, Hochschule für Technik und Wirtschaft Dresden (Germany); M. Scheuering, Siemens Medical Solutions (Germany) . . . . . [6141-14]

2:20 pm: **Image segmentation and registration for the analysis of joint motion from 3D MRI,** Y. Hu, D. R. Haynor, Univ. of Washington; M. Fassbind, E. Horh, W. Ledoux, VA Puget Sound Health Care System . . . . . [6141-15]

2:40 pm: **Fast volume driven DRR rendering for 2D/3D registration,** W. Birkfellner, R. Seemann, M. Figl, X. Yang, H. Bergmann, Medizinische Univ. Wien (Austria) . . . . . [6141-16]

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

6147 continues on page 16

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 3

RM: Town & Country Sun. 1:20 to 3:00 pm

Tomosynthesis

Chair: **Richard L. Van Metter**, Eastman Kodak Co.

1:20 pm: **Evaluation of a photon-counting breast tomosynthesis imaging system,** A. D. A. Maidment, Univ. of Pennsylvania; L. Adelöw, O. Blom, J. Egerström, M. Eklund, T. Francke, U. Jordung, T. Kristoffersson, K. Lindman, L. Lindqvist, D. Marchal, H. Olla, E. Penton, J. Rantanen, S. Solokiv, C. K. Ullberg, N. Weber, H. Westerberg, XCounter AB (Sweden) . . . . . [6142-11]

1:40 pm: **High-speed large-angle mammography tomosynthesis system,** J. W. Eberhard, P. Staudinger, J. Smolenski, J. Ding, A. Schmitz, J. McCoy, A. Al-Khalidy, M. A. Rumsey, W. Ross, C. E. Landberg, B. E. Claus, GE Global Research; P. L. Carson, M. M. Goodsitt, H. Chan, M. A. Roubidoux, Univ. of Michigan Medical Ctr.; J. Thomas, J. Osland, Via Christi Regional Medical Ctr. . . . . [6142-12]

2:00 pm: **Quantification for contrast-enhanced digital breast tomosynthesis,** A. G. Carton, J. Li, M. Albert, S. Chen, A. D. Maidment, Univ. of Pennsylvania . . . . . [6142-13]

2:20 pm: **Gaussian frequency blending algorithm with matrix inversion tomosynthesis (MITS) and filtered back projection (FBP) for better digital breast tomosynthesis reconstruction,** Y. Chen, Duke Univ. and Duke Univ. Medical Ctr.; J. Y. Lo, Duke Univ. and Duke Univ. Medical Ctr. and Duke Univ.; J. T. Dobbins III, Duke Univ. and Duke Univ. Medical Ctr. . . . . [6142-14]

2:40 pm: **Optimizing filtered backprojection reconstruction for a breast tomosynthesis prototype device,** T. Mertelmeier, W. Haerer, J. Orman, M. K. Dudam, Siemens AG (Germany) . . . . . [6142-15]

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

6142 continues on page 16

Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 3

RM: California . . . . Sun. 1:20 to 3:00 pm

Vessel Imaging and Dynamics

Chair: **Erik L. Ritman**, Mayo Clinic

1:20 pm: **Quantitative evaluation of carotid arterial plaque surface irregularity,** J. Robinson, L. Brevetti, P. J. Yim, Univ. of Medicine and Denistry of New Jersey . . . . [6143-10]

1:40 pm: **Quantification of carotid vessel atherosclerosis,** B. Chiu, A. Fenster, Robarts Research Institute (Canada) . . . . . [6143-11]

2:00 pm: **Pulsatile pressure measurements via harmonics-based orthogonal projection of noisy pressure gradients,** Y. Wang, Huazhong Univ. of Science and Technology (China); J. R. Cebral, George Mason Univ.; A. A. Amini, Washington Univ. in St. Louis [6143-12]

2:20 pm: **Patient-specific models of wall stress in abdominal aortic aneurysm: a comparison between MR and CT,** S. de Putter, Technische Univ. Eindhoven (Netherlands); M. Breeuwer, Philips Medical Systems (Netherlands); F. van de Vosse, Technische Univ. Eindhoven (Netherlands); F. Gerritsen, Philips Medical Systems (Netherlands) . . . . . [6143-13]

2:40 pm: **(ST) Effects of parent vessel geometry on intraaneurysmal flow patterns,** M. A. Castro, George Mason Univ.; C. M. Putman, Inova Fairfax Hospital; J. R. Cebral, George Mason Univ. . . . . [6143-14]

2:50 pm: **(ST) Effects of segmentation on patient-specific numerical simulation of cerebral aneurysm hemodynamics,** P. Venugopal, H. Schmitt, Philips Medical Systems; G. Duckwiler, D. Valentino, Univ. of California/Los Angeles . . . . . [6143-15]

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

6143 continues on page 16

Conference 6147 *continued*

Ultrasonic Imaging and Signal Processing

ROOM: Golden West

SESSION 3

RM: Golden West . . Sun. 1:20 to 3:05 pm

General Imaging

Chair: **Jesse Yen**, Univ. of Southern California

1:20 pm: **Remote consulting based on ultrasound digital immages and dynamic ultrasound sequences,** A. Margan, Insula-Scientific Council for Island Development (Croatia); N. Rustemovic, Univ. Clinical Hospital Centre Rebro (Croatia) . . . . [6147-15]

1:35 pm: **Quantitative ultrasound imaging of healthy and reconstruted cleft lips: a feasibility study,** J. M. Thijssen, N. J. van Hees, G. Weijers, R. W. Huyskens, M. M. Nillesen, C. Katsaros, C. L. de Korte, Univ. Medisch Ctr. St. Radboud (Netherlands) . . . . . [6147-16]

1:50 pm: **Integrated system for ultrasonic, photoacoustic and elasticity imaging,** S. Park, J. Shah, S. R. Aglyamov, A. Karpiouk, S. Mallidi, X. J. Zhang, The Univ. of Texas at Austin; W. G. Scott, WinProbe Corp.; S. Y. Emelianov, The Univ. of Texas at Austin . . . . . [6147-17]

2:05 pm: **Ultrasonic imaging with time-reversed ultrasound,** L. Huang, Los Alamos National Lab.; N. Duric, P. Littrup, Karmanos Cancer Institute . . . . . [6147-18]

2:20 pm: **Detection of brachytherapy seeds using ultrasound radio frequency signals,** X. Wen, S. E. Salcudean, P. D. Lawrence, The Univ. of British Columbia (Canada) [6147-19]

2:35 pm: **Investigation of foreign objects in soft-tissue by a PE-CMOS ultrasound system: a preliminary comparative study,** S. B. Lo, C. B. Liu, Georgetown Univ.; M. T. Freedman, Georgetown Univ. Medical Ctr.; M. E. Lasser, Imperium, Inc.; Y. J. Wang, T. I. Hsieh, Virginia Polytechnic Institute and State Univ.; A. Sarcone, Georgetown Univ. . . . . [6147-20]

2:50 pm: **Image stitching for three-pass whole breast ultrasound,** R. Chang, C. Chen, National Chung Cheng Univ. (Taiwan); E. Takada, Dokkyo Univ. School of Medicine (Japan); D. Chen, Changhua Christian Hospital (Taiwan); Y. Chou, Taipei Veterans General Hospital (Taiwan) . . . . . [6147-21]

Coffee Break . . . . . 3:05 to 3:30 pm

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Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 4

RM: San Diego . . . . Sun. 3:30 to 5:30 pm

Electromagnetic Tracking and Open Source Software

Chairs: **Steven L. Hartman**, Vanderbilt Univ.; **Pierre Jannin**, Univ. de Rennes I (France)

3:30 pm: **Accuracy protocols to access the influence of metallic objects on the performance of an electromagnetic tracking system,** S. R. Kirsch, C. J. Schi, G. Brunner, NDI Europe GmbH (Germany) . . [6141-17]

3:50 pm: **Method for estimating dynamic EM tracking accuracy of surgical navigation tools,** C. Nafis, GE Global Research; V. T. Jensen, L. Beauregard, P. T. Anderson, GE Healthcare . . . . . [6141-18]

4:10 pm: **Fluoroscopy based accuracy assessment of electromagnetic tracking,** Z. R. Yaniv, K. R. Cleary, Georgetown Univ. . . . . [6141-19]

4:30 pm: **A system for rapid prototyping of hearts with congenital malformations based on the medical imaging interaction toolkit (MITK),** I. Wolf, T. Böttger, U. Rietdorf, Deutsches Krebsforschungszentrum (Germany); G. Greil, Univ. Tübingen (Germany); S. Mottl-Link, H. Meinzer, Deutsches Krebsforschungszentrum (Germany) . . . . . [6141-20]

4:50 pm: **Comprehensive, powerful, efficient, intuitive: a new framework for clinical imaging applications,** K. E. Augustine, D. R. Holmes III, D. P. Hanson, R. A. Robb, Mayo Clinic . . . . . [6141-21]

5:10 pm: **Creation of 4D imaging data using open source image registration software,** K. H. Wong, Georgetown Univ.; L. Ibanez, Kitware Inc.; T. R. Popa, K. R. Cleary, Georgetown Univ. . . . . [6141-22]

Workshop

RM: San Diego . . Sun. 5:45 to 6:45 pm

The Open-Source Software Movement: What's In It for You?

Chairs: **Kevin R. Cleary**, Georgetown Univ.; **Terry S. Yoo**, National Library of Medicine; **Michael I. Miga**, Vanderbilt Univ.; **John W. Haller**, National Institute of Biomedical Imaging and Bioengineering; **Keyvan Farahani**, National Cancer Institute; **Laurence P. Clarke**, National Cancer Institute; **Peter Lyster**, National Institute of Biomedical Imaging and Bioengineering

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Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 4

RM: Town & Country Sun. 3:30 to 5:30 pm

X-ray CT: Cardiac

Chair: **Jiang Hsieh**, GE Healthcare

3:30 pm: **Motion artifacts from an inverse-geometry CT system with multiple detector arrays,** S. R. Mazin, N. J. Pelc, Stanford Univ. . . [6142-16]

3:50 pm: **Design considerations in cardiac CT,** H. K. Bruder, Siemens AG (Germany); R. Raupach, K. Stierstorfer, M. Petersilka, T. Flohr, B. Ohnesorge, Siemens Medical Solutions (Germany) . . . . . [6142-17]

4:10 pm: **Effect of heart rate on CT angiography using the enhanced cardiac model of the 4D NCAT,** W. P. Segars, K. Taguchi, G. S. K. Fung, E. K. Fishman, B. M. Tsui, Johns Hopkins Univ. . . . . [6142-18]

4:30 pm: **Toward time resolved 4D cardiac CT imaging with patient dose reduction: estimating the global heart motion,** K. Taguchi, W. P. Segars, Johns Hopkins Univ.; G. S. K. Fung, The Univ. of Hong Kong (Hong Kong China); B. M. W. Tsui, Johns Hopkins Univ. . . . . [6142-19]

4:50 pm: **Optimized time window for cardiac CT reconstruction based on Doppler tissue imaging (DTI) data,** R. Guerra, Univ. Henri Poincaré Nancy I (France) and Siemens Medical Solutions (France); A. Codreanu, Y. Ponvianne, R. Grosjean, J. Felblinger, Univ. Henri Poincaré Nancy I (France) . . . . . [6142-20]

5:10 pm: **ECG gated continuous circular cone-beam multicycle reconstruction for in-stent coronary artery imaging: a phantom study,** U. van Stevendaal, P. Koken, Philips Research Labs. (Germany); P. G. C. Begemann, R. Koester, G. Adam, Univ. Hospital Hamburg-Eppendorf (Germany); M. Grass, Philips Research Labs. (Germany) . . . . . [6142-21]

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Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

3:30 pm: **Imaging and CFD in the analysis of vascular disease progression** *(Invited Paper),* D. Saloner, Univ. of California/San Francisco . . . . . [6143-16]

4:00 pm: **(ST) Reproducibility of brain hemodynamic simulations: an inter-solver comparison,** X. He, Univ. of California/Los Angeles; P. Venugopal, Philips Medical Systems; J. R. Cebral, George Mason Univ.; H. Schmitt, Philips Medical Systems; D. J. Valentino, Univ. of California/Los Angeles . . . . . [6143-17]

4:10 pm: **A study of the hemodynamics of anterior communicating artery aneurysms,** M. A. Castro, George Mason Univ.; C. M. Putman, Inova Fairfax Hospital; J. R. Cebral, George Mason Univ. . . . . [6143-18]

4:30 pm: **Flow modification in canine intracranial aneurysm model by an asymmetric stent: studies using digital subtraction angiography (DSA) and image-based computational fluid dynamics (CFD) analyses,** Y. Hoi, C. N. Ionita, R. V. Tranquebar, K. R. Hoffmann, S. H. Woodward, D. B. Taulbee, H. Meng, S. Rudin, SUNY/Univ. at Buffalo . . . . . [6143-19]

4:50 pm: **Towards patient-specific modeling: hemodynamics is a growing aneurysm,** C. A. Figueroa, Stanford Univ.; S. Baek, Texas A&M Univ.; I. E. Vignon-Clementel, Stanford Univ.; J. D. Humphrey, Texas A&M Univ.; C. A. Taylor, Stanford Univ. . . . . [6143-20]

5:10 pm: **Dynamic pressure at sites of virtually removed paraclinoid aneurysms: a computational fluid dynamics study,** C. Karmonik, Methodist Hospital Research Institute; A. R. Mantha, Univ. of Houston; C. M. Strother, Baylor College of Medicine and The Methodist Hospital; G. Benndorf, Baylor College of Medicine; R. Metcalfe, Univ. of Houston . . . . . [6143-21]

Workshop

RM: California . Sun. 5:45 to 7:45 pm

Cerebrovascular Modeling and Simulation

Speakers: **Fernando Vinuela**, Univ. of California/Los Angeles; **Alejandro F. Frangi**, Univ. Pompeu Fabra (Spain); **Charles A. Taylor**, Stanford Univ.; **Juan R. Cebral**, George Mason Univ.; **Juan Lasheras**, Univ. of California/San Diego; **Daniel J. Valentino**, Univ. of California/Los Angeles

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Conference 6147 *continued*

Ultrasonic Imaging and Signal Processing

ROOM: Golden West

SESSION 4

RM: Golden West . . Sun. 3:30 to 5:00 pm

Cardiac Imaging

Chair: **John A. Hossack**, Univ. of Virginia

3:30 pm: **A scalable beamforming architecture for real-time 3D ultrasonic imaging using nonuniform sampling,** O. S. Dandekar, Univ. of Maryland/College Park and Univ. of Maryland/Baltimore; C. R. Castro-Pareja, R. Shekhar, Univ. of Maryland/Baltimore . . . . . [6147-22]

3:45 pm: **Three-dimensional segmentation of the heart muscle using image statistics,** M. M. Nillesen, R. G. P. Lopata, I. H. Gerrits, Univ. Medisch Ctr. Rotterdam (Netherlands); L. Kapusta, H. H. Huisman, J. M. Thijssen, C. L. de Korte, Univ. Medisch Ctr. St. Radboud (Netherlands) . . . . . [6147-23]

4:00 pm: **Cardiac current mapping using the acousto-electric effect,** R. Olafsson, R. Witte, K. Kim, S. Ashkenazi, M. O'Donnell, Univ. of Michigan . . . . . [6147-24]

4:15 pm: **Towards real-time endocardial boundary detection from intracardiac echocardiographic images: a comparative study,** Y. Ganji, Univ. of Waterloo (Canada) . . . . . [6147-25]

4:30 pm: **Novel spatiotemporal voxel interpolation with multibeat fusion for 3D echocardiography with irregular data distribution,** J. G. Bosch, Erasmus Medical Ctr. (Netherlands); M. van Stralen, Erasmus Medical Ctr (Netherlands) and ICIN (Netherlands) and LUMC (Netherlands); M. M. Voormolen, Erasmus Medical Ctr. (Netherlands) and ICIN (Netherlands); B. J. Krenning, C. T. Lancée, Erasmus Medical Ctr. (Netherlands); J. H. C. Reiber, Leids Univ. Medisch Ctr. (Netherlands); A. F. W. van der Steen, Erasmus Medical Ctr. (Netherlands) and ICIN (Netherlands); N. de Jong, Erasmus Medical Ctr. (Netherlands) and Univ. of Twente (Netherlands) . . . . . [6147-26]

4:45 pm: **Development of a high frame rate ultrasonic system for cardiac imaging in small animals,** L. Sun, J. M. Cannata, Univ. of Southern California; J. Johnson, Capistrano Labs., Inc.; J. Yen, Univ. of Southern California; C. C. Feng, Capistrano Labs., Inc.; K. K. Shung, Univ. of Southern California [6147-27]

6147 Ends ■

✔The following posters will be on display Sunday and Monday, 12-13 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Monday evening from 5:30 to 7:00 pm. Poster awards will be presented at 6:30 pm during the poster reception.

Conference 6141
Visualization, Image-Guided Procedures, and Display

Display

✔ **Physical study of the spatial noise of several medical LCDs,** H. Roehrig, J. Fan, K. A. Gandhi, E. A. Krupinski, The Univ. of Arizona . . . [6141-59]

✔ **A virtual image chain for perceived image quality of medical display,** C. Marchessoux, J. Jung, Agfa-Gevaert NV (Belgium) . . . [6141-60]

✔ **Measurement of MTFs for monochrome and color liquid crystal displays,** A. Horii, M. Takamura, K. Ichikawa, Y. Kodera, M. Ikeda, T. Ishigaki, Nagoya Univ. (Japan) . . . . . [6141-61]

Image-Guided Procedures

✔ **Magnetic resonance imaging for image-guided implantology,** G. Eggers, B. Kress, Ruprecht-Karls-Univ. Heidelberg (Germany); J. B. Fiebach, Univ. Duisburg-Essen (Germany); M. Rieker, D. Spitzenberg, R. Marmulla, H. Dickhaus, J. Mühling, Ruprecht-Karls-Univ. Heidelberg (Germany) . . . . . [6141-63]

✔ **Electromagnetic tracker accuracy in CyberKnife suite,** E. Wilson, H. J. Zhang, K. R. Cleary, Georgetown Univ. . . . . [6141-64]

✔ **Multimodal augmented reality system for surgical microscopy,** J. Garcia Giraldez, H. Talib, M. Caversaccio, M. A. Gonzalez Ballester, Univ. Bern (Switzerland) . . . . . [6141-65]

✔ **Near-infrared imaging and structured light ranging for automatic catheter insertion,** V. C. Paquit, J. R. Price, Oak Ridge National Lab.; R. Seulin, F. Meriaudeau, Univ. de Bourgogne (France); K. W. Tobin, Jr., Oak Ridge National Lab. . . . . [6141-66]

✔ **Feasibility study for image guided kidney surgery: assessment of required intraoperative surface for accurate image to physical registrations,** A. B. Benincasa, L. W. Clements, S. D. Herrell, S. S. Chang, M. S. Cookson, R. L. Galloway, Jr., Vanderbilt Univ. . . . . [6141-67]

✔ **Computerized fluoroscopy with zero-dose image updates for minimally invasive femoral diaphyseal fracture reduction,** G. Zheng, X. Dong, Univ. Bern (Switzerland) . . . . . [6141-68]

✔ **An effective technique for calibrating the intrinsic parameters of a vascular C-arm from a planar target,** S. Gorges, K. Erwan, M. Berger, LORIA (France); Y. L. Trousset, J. Pescatore, GE Healthcare (France) . . . . . [6141-69]

✔ **Noninvasive CT to Iso-C3D registration for improved intraoperative visualization in computer assisted orthopedic surgery,** T. Rudolph, L. Ebert, J. Kowal, Univ. Bern (Switzerland) . . . . . [6141-70]

✔ **IGSTK: framework and example applications using an open source toolkit for image-guided surgery applications,** K. R. Cleary, Georgetown Univ.; H. Kim, P. Cheng, Georgetown Univ. Medical Ctr.; K. Gary, Arizona State Univ.; M. B. Blake, Georgetown Univ.; S. Aylward, Univ. of North Carolina/Chapel Hill; J. Jomier, The Univ. of North Carolina at Chapel Hill; D. G. Gobbi, The Univ. of Western Ontario (Canada); L. Ibanez, R. Avila, Kitware Inc. . . . . [6141-71]

✔ **Comparison of three electromagnetic tracking systems using a standard protocol,** J. B. Hummel, M. Figl, W. Birkfellner, Medizinische Univ. Wien (Austria); M. R. Bax, C. R. Maurer, Jr., R. Shahidi, Stanford Univ.; K. Schicho, H. Bergmann, Medizinische Univ. Wien (Austria) . . . . . [6141-72]

Modeling

✔ **Volumetric CT measurement of the ischial tuberosities for designing analytical models of decubitus ulcers,** D. R. Holmes III, R. A. Robb, Mayo Clinic . . . . . [6141-73]

✔ **Segmentation of the left and right cardiac ventricle using a combined bi-temporal statistical model,** D. Fritz, Univ. Karlsruhe (Germany); D. Rinck, Siemens Medical Solutions (Germany); R. Dillmann, Univ. Karlsruhe (Germany); M. Scheuering, Siemens Medical Solutions (Germany) . . . . . [6141-74]

✔ **Computational flow dynamics in patient specific model of cardiovascular system using CT and MRI,** S. Yamamoto, Tohoku Univ. (Japan); H. Bartsch, Mercury Computer Systems, Inc.; S. Maruyama, GEO Planning Co., Ltd. (Japan); S. Yoneyama, Maxnet Co., Ltd. (Japan); S. Wada, T. Yamaguchi, Tohoku Univ. (Japan); H. Naito, Osaka Univ. (Japan) . . . . . [6141-75]

✔ **Subdivision-based parametric deformable model for surface extraction and creation of 3D statistical shape modeling of the knee cartilages,** J. E. Fripp, Commonwealth Scientific & Industrial Research Organisation (Australia); S. Crozier, Univ. of Queensland (Australia); S. K. Warfield, Brigham and Women's Hospital; S. Ourselin, Commonwealth Scientific & Industrial Research Organisation (Australia) . . . . . [6141-76]

✔ **Optimizing needle placement in radiofrequency ablation treatment planning,** C. R. Chen, M. I. Miga, R. L. Galloway, Jr., Vanderbilt Univ. . . . . [6141-77]

✔ **Automatic surface correspondence methods for a deformed breast,** D. R. Schuler III, J. J. Ou, S. L. Barnes, M. I. Miga, Vanderbilt Univ. [6141-78]

Neuro

✔ **A pediatric brain structure atlas from T1-weighted MR images,** Z. Y. Shan, St. Jude Children's Research Hospital; C. A. Parra, Univ. of Memphis; Q. Ji, R. J. Ogg, F. H. Laningham, W. E. Reddick, St. Jude Children's Research Hospital . . . . . [6141-79]

✔ **Flow visualization for qualitative assessment of brainshift,** L. Zagorchev, Philips Research North America; A. Goshtasby, Wright State Univ.; M. Satter, Kettering Medical Ctr. Foundation . . . . . [6141-80]

✔ **Improving image-guided neurosurgery using low-field intra-operative magnetic resonance imaging,** D. M. Wikler, Univ. Libre de Bruxelles (Belgium); M. Kavec, C. L. Phillips, L. M. Vigneron, Univ. de Liège (Belgium); J. Brotchi, Univ. Libre de Bruxelles (Belgium); J. G. Verly, Univ. de Liège (Belgium); M. Levivier, Univ. Libre de Bruxelles (Belgium) . . . . . [6141-81]

✔ **Localization and labeling of rat brain in MRI based on Paxinos-Watson atlas,** J. Cao, C. Cai, M. Ding, C. Zhou, Huazhong Univ. of Science and Technology (China) . . . . . [6141-82]

✔ **Subdural and depth electrode placement in the brain for validation of MEG in partial epilepsy,** M. Siadat, K. V. Elisevich, H. Soltanian-Zadeh, S. Bowyer, Henry Ford Health System . . [6141-83]

✔ **A robust surface registration using a Gaussian-weighted distance map for brain PET-CT fusion,** H. Lee, H. Hong, Seoul National Univ. (South Korea) . . . . . [6141-84]

✔ **Registration of laser range image of cortical surface to preoperative brain MR images for image-guided neurosurgery: preliminary results,** B. Tsagaan, K. Abe, K. Iwami, Shizuoka Univ. (Japan); S. Yamamoto, S. Terakawa, Hamamatsu Univ. School of Medicine (Japan) . . . . . [6141-85]

✔ **Segmentation of brain volume based on 3D region growing by integrating intensity and edge for image-guided surgery,** B. Tsagaan, K. Abe, M. Goto, Shizuoka Univ. (Japan); S. Yamamoto, S. Terakawa, Hamamatsu Univ. School of Medicine (Japan) . . . . . [6141-86]

✔ **Knowledge modeling in image-guided neurosurgery: application in understanding intraoperative brain shift,** J. Cohen-Adad, P. Paul, X. Morandi, P. Jannin, Univ. de Rennes I (France) . . . . . [6141-87]

Registration

✔ **Assessment of radio frequency ablation treatment of hepatic tumors,** P. F. Hemler, Hampden-Sydney College; E. S. McCreedy, R. Cheng, B. J. Wood, M. J. McAuliffe, National Institutes of Health . . . . . [6141-88]

✔ **Fast 2D-3D marker-based registration of CT and X-ray fluoroscopy images for image-guided surgery,** H. Hong, K. Kim, S. Park, Seoul National Univ. (South Korea) . . . . . [6141-89]

✔ **Sequential intrinsic and extrinsic geometry calibration in fluoro CT imaging and navigation with a mobile C-arm,** A. Cheryauka, S. Breham, W. D. Christensen, GE Healthcare . . . . . [6141-90]

✔ **Spatio-temporal analysis tool for modeling pulmonary nodules in MR images,** L. Shen, J. Lu, Univ. of Massachusetts/Dartmouth; J. Ford, Dartmouth College; L. Gao, Dartmouth Medical School; H. Huang, W. Zheng, F. Makedon, Dartmouth College; J. D. Pearlman, Dartmouth Medical School . . . . . [6141-91]

✔ **ITK implementation of deformable registration methods for time-varying (4D) imaging data,** T. R. Popa, Georgetown Univ.; L. Ibanez, Kitware Inc.; K. R. Cleary, K. H. Wong, Georgetown Univ. . . . . [6141-92]

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Chairs: **James C. Gee**, Univ. of Pennsylvania; **Calvin R. Maurer, Jr.**, Accuray Inc.

Registration

Chairs: **James C. Gee**, Univ. of Pennsylvania; **Calvin R. Maurer, Jr.**, Accuray Inc.

✔ **Validation of elastic registration algorithms based on adaptive irregular grids for medical applications,** A. Franz, I. C. Carlsen, S. Renisch, H. Wischmann, Philips Research Labs. (Germany) . . . . . [6144-78]

✔ **A strategy based on maximum spanning trees to stitch together microscope images,** P. Thévenaz, École Polytechnique Fédérale de Lausanne (Switzerland); D. Lambiel, Univ. Laval (Canada); M. A. Unser, École Polytechnique Fédérale de Lausanne (Switzerland) . . . [6144-79]

✔ **Weighted medical image registration with automatic mask generation,** H. Schumacher, Univ. zu Lübeck (Germany); A. Franz, Philips Research Labs. (Germany); B. Fischer, Univ. zu Lübeck (Germany) . . . . . [6144-80]

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✔ **Non-rigid registration for fusion of carotid vascular ultrasound and MRI volumetric datasets,** R. C. Chan, S. Sokka, Philips Research North America; D. Hinton, S. L. Houser, Massachusetts General Hospital; R. M. Manzke, Philips Research North America; A. Hanekamp, Philips Research USA; V. Reddy, Massachusetts General Hospital; M. R. Kaazempur-Mofrad, Univ of California/Berkeley; V. Rasche, Philips Medical Systems . . . . . [6144-83]

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✔ **A variational approach to spatially dependent non-rigid registration,** F. Jäger, J. Han, J. Hornegger, T. Kuwert, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [6144-94]

✔ **A practical salient region feature based 3D multimodality registration method for medical images,** D. A. Hahn, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Y. Sun, Siemens Corporate Research; J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); C. Xu, Siemens Corporate Research; G. Wolz, T. Kuwert, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [6144-95]

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✔ **Automatic lung nodule matching for the follow-up in temporal chest CT scans,** H. Hong, J. Lee, Seoul National Univ. (South Korea) . . . . [6144-99]

✔ **Distance transform for automatic dermatologic images composition,** C. Grana, R. Cucchiara, Univ. degli Studi di Modena e Reggio Emilia (Italy) . . . . . [6144-100]

✔ **Registration and 3D visualization of large microscopy images,** K. R. Mosaliganti, T. Pan, R. Sharp, Jr., R. Ridgway, R. Machiraju, K. Huang, J. H. Saltz, The Ohio State Univ. . . . . [6144-101]

✔ **Registration of knee joint surfaces for the in-vivo study of joint injuries based on magnetic resonance imaging,** R. Cheng, A. Habib, R. Frayne, J. Ronsky, Univ. of Calgary (Canada) . . . . . [6144-102]

✔ **A unified framework for segmentation-assisted image registration,** J. Liu, Ohio Univ. . [6144-103]

✔ **Elastic registration using 3D chainmail: application to virtual colonoscopy,** C. R. Castro-Pareja, B. Daly, R. Shekhar, Univ. of Maryland/ Baltimore . . . . . [6144-104]

✔ **Automated feature-based alignment for 3D volume reconstruction of CLSM imagery,** S. Lee, P. Bajcsy, Univ. of Illinois at Urbana-Champaign . . . . . [6144-105]

✔ **Automatic 3D image registration using voxel similarity measurements based on a genetic algorithm,** W. Huang, J. M. Sullivan, Jr., P. Kulkarni, M. Murugavel, Worcester Polytechnic Institute . . . . . [6144-106]

✔ **Improved 2D/3D registration robustness using local spatial information,** E. De Momi, Politecnico di Milano (Italy); K. Eckman, Carnegie Mellon Univ.; B. Jaramaz, A. M. Di Gioia III, The Western Pennsylvania Hospital . . . . . [6144-107]

✔ **Vessel-based registration with application to nodule detection in thoracic CT scans,** G. Agam, C. Wu, Illinois Institute of Technology . [6144-108]

✔ **Mathematical properties of information theoretic image similarity measures,** O. _krinjar, Georgia Institute of Technology . . . . . [6144-109]

✔ **Fast surface alignment for cardiac spatio-temporal modeling: application to ischemic cardiac shape modeling,** H. Huang, Dartmouth College; L. Shen, Univ. of Massachusetts/ Dartmouth; R. Zhang, F. Makedon, J. D. Pearlman, Dartmouth College . . . . . [6144-110]

✔ **Iterative deformable FEM model for nonrigid PET/MRI breast image coregistration,** M. Z. Unlu, Syracuse Univ.; A. Krol, Upstate Medical Univ./SUNY; A. W. Magri, Syracuse Univ.; D. H. Feiglin, Upstate Medical Univ./SUNY; J. A. Mandel, E. D. Lipson, Syracuse Univ.; I. L. Coman, Ithaca College; W. Lee, Syracuse Univ.; G. M. Tillapaugh-Fay, Upstate Medical Univ./SUNY . . . . [6144-111]

✔ **Temporal registration of 2D x-ray mammogram using triangular B-splines finite element method (TBFEM),** K. Wang, Y. He, H. Qin, P. R. Fisher, W. Zhao, Stony Brook Univ. [6144-112]

✔ **Establishing multimodality datasets with the incorporation of 3D histopathology for soft tissue classification,** J. C. de Ryk, J. R. Thiesse, Univ. of Iowa Hospitals and Clinics; J. M. Reinhardt, The Univ. of Iowa; E. A. Hoffman, G. McLennan, Univ. of Iowa Hospitals and Clinics . . . . . [6144-113]

✔ **Initial comparison of registration and fusion of CmT-SPECT mammotomography images,** E. Dura-Martinez, P. Madhav, T. Turkington, S. J. Cutler, M. P. Tornai, Duke Univ. . . [6144-114]

✔ **Motion correction via nonrigid coregistration of dynamic MR mammography series,** A. W. Magri, Syracuse Univ.; A. Krol, Upstate Medical Univ./ SUNY; M. Z. Unlu, Syracuse Univ.; D. H. Feiglin, Upstate Medical Univ./SUNY; E. D. Lipson, J. A. Mandel, Syracuse Univ.; G. M. Tillapaugh-Fay, Upstate Medical Univ./SUNY; W. Lee, Syracuse Univ.; I. L. Coman, Ithaca College . . . . . [6144-115]

✔ **Alignment of full and partial CT thoracic scans using bony structure,** M. A. Gavrielides, N. Petrick, K. J. Myers, U.S. Food and Drug Administration . . . . . [6144-116]

✔ **Image registration of proximal femur with substantial bone changes: application in 3D visualization of bone loss of astronauts after long-duration spaceflight,** W. Li, M. Sode, I. Saeed, T. Lang, Univ. of California/San Francisco . . . . . [6144-117]

✔ **Evaluation of similarity measures for intensity-based 2D registration in radiotherapy,** J. Wu, S. S. Samant, Univ. of Florida . . . . . [6144-118]

✔ **Supporting registration decisions during 3D medical volume reconstructions,** P. Bajcsy, S. Lee, D. Clutter, Univ. of Illinois at Urbana-Champaign . . . . . [6144-119]

Segmentation

✔ **An automatic segmentation method for multispectral microscopic cervical cell images,** H. Zhang, L. Zeng, H. Ke, H. Zheng, J. Lei, X. Xu, Q. Wu, D. Wang, Wuhan Univ. (China); Y. Zhang, Information Engineering Univ. of PLA (China) . . . . . [6144-120]

✔ **Characterization of the optic disc in retinal imagery using a probabilistic approach,** K. W. Tobin, Jr., Oak Ridge National Lab.; E. Chaum, Univ. of Tennessee Health Science Ctr.; V. P. Govindasamy, T. P. Karnowski, Oak Ridge National Lab.; O. Sezer, Univ. of Tennessee . . . . . [6144-121]

✔ **Automatic segmentation method which divides a cerebral artery tree in time-of-flight MR-angiography into artery segments,** A. Takemura, Kanazawa Univ. (Japan); M. Suzuki, Kanazawa Univ.; H. Harauchi, Kawasaki College of Allied Health Professions (Japan); Y. Okumura, Saiseikai Kanazawa Hospital (Japan); T. Umeda, Kitasato Univ. (Japan) . . . . . [6144-122]

✔ **SIBS, a powerful concept for automatic segmentation of electron tomograms,** A. A. Linaroudis, R. Hegerl, Max-Planck-Institut für Biochemie (Germany) . . . . . [6144-123]

✔ **Generalized expectation-maximization segmentation of brain MR images,** A. A. Devalkeneer, P. A. Robe, J. G. Verly, C. L. Phillips, Univ. of Liège (Belgium) . [6144-124]

✔ **Texture-based instrument segmentation in 3D ultrasound images,** M. G. Linguraru, R. D. Howe, Harvard Univ. . . . . [6144-125]

✔ **Vasculature segmentation for radio frequency ablation of non-resectable hepatic tumors,** P. F. Hemler, Hampden-Sydney College; E. S. McCreedy, R. Cheng, B. Wood, M. McAuliffe, National Institutes of Health . . . . . [6144-126]

✔ **kNN-based multispectral MRI brain tissue classification: manual training versus automatic Atlas-based training,** H. A. Vrooman, Erasmus Univ. Medical Ctr. (Netherlands); C. A. Cocosco, Philips Research Labs. (Germany); R. Stokking, A. M. Ikram, M. W. Vernooij, M. M. Breteler, W. J. Niessen, Erasmus Univ. Medical Ctr. (Netherlands) . . . . . [6144-127]

✔ **Fully-automated analysis of multiresolution four-channel micro-array genotyping data,** M. Abbaspour, S. J. Tebbutt, M. Podder, R. Abugharbieh, The Univ. of British Columbia (Canada) . . . . . [6144-128]

✔ **Iterative live wire and live snake: new user-steered 3D image segmentation paradigms,** A. D. Souza, J. K. Udupa, Univ. of Pennsylvania; G. J. Grevera, Saint Joseph's Univ.; Y. Sun, D. Odhner, M. D. Schnall, Univ. of Pennsylvania . . . . . [6144-129]

✔ **Automatic LV volume measurement in low dose multiphase CT by shape tracking,** J. von Berg, Philips Research Labs. (Germany); P. G. C. Begemann, Univ. Hospital Hamburg-Eppendorf (Germany); F. Stahmer, Univ. Medical Ctr. Hamburg-Eppendorf (Germany); G. Adam, Univ. Hospital Hamburg-Eppendorf (Germany); C. Lorenz, Philips Research Labs. (Germany) . . . . . [6144-130]

✔ **Fast, shape-directed, landmark-based deep gray matter segmentation for quantification of iron deposition,** A. Ekin, R. S. Jasinschi, Philips Research Labs. (Netherlands); M. van Buchem, Leiden Univ. (Netherlands); J. van der Grond, Leids Univ. Medisch Ctr. (Netherlands); A. van Muiswinkel, Philips Medical Systems (Netherlands) . . . . . [6144-131]

✔ **Automated brain segmentation using neural networks,** S. Powell, V. A. Magnotta, H. J. Johnson, N. C. Andreasen, The Univ. of Iowa . . . . . [6144-132]

✔ **Modeling shape variability for full heart segmentation in cardiac CT images,** O. Ecabert, J. Peters, J. Weese, Philips Research Labs. (Germany) . . . . . [6144-133]

✔ **Comparison of color clustering algorithms for segmentation of dermatological images,** R. Cucchiara, R. M. Melli, C. Grana, Univ. degli Studi di Modena e Reggio Emilia (Italy) [6144-134]

✔ **MATLAB-ITK interface for medical image filtering, segmentation, and registration,** V. Chu, G. Hamarneh, Simon Fraser Univ. (Canada) . . . . . [6144-135]

✔ **An adipose segmentation and quantification scheme for the intra abdominal region on minipigs,** R. Engholm, A. Dubinskiy, R. D. Larsen, Danmarks Tekniske Univ. (Denmark); L. G. Hanson, Copenhagen Univ. Hospital/Hvidovre (Denmark); B. Ø. Christoffersen, The Royal Veterinary and Agricultural Univ. (Denmark) . . . . . [6144-136]

✔ **Automated method for measurement of gray matter thickness in Alzheimer's patients for 3D MRI,** H. Arimura, T. Yoshiura, S. Kumazawa, H. Koga, S. Sakai, F. Mihara, H. Honda, M. Ohki, F. Toyofuku, Y. Higashida, Kyushu Univ. (Japan) . . . . . [6144-137]

✔ **A two-stage segmentation method for lesion segmentation on digital mammograms,** Y. Yuan, M. L. Giger, K. Suzuki, H. Li, A. R. Jamieson, The Univ. of Chicago . . . . . [6144-138]

✔ **Automatic determination of the imaging plane in lumbar,** M. Tsurumaki, Nakajo Central Hospital (Japan) and Niigata Univ. (Japan); Y. Lee, D. Tsai, M. Sekiya, Niigata Univ. (Japan); K. Kazama, Nakajo Central Hospital (Japan) . . . . . [6144-139]

✔ **White matter fiber tractography based on a density field in diffusion tensor MRI,** S. Kumazawa, T. Yoshiura, H. Arimura, F. Mihara, H. Honda, Y. Higashida, F. Toyofuku, Kyushu Univ. (Japan) . . . . . [6144-140]

✔ **Fuzzy C-mean clustering on kinetic parameter estimation with generalized linear least square algorithm in SPECT,** H. C. Choi, The Univ. of Sydney (Australia); L. Wen, The Univ. of Sydney (Australia) and Royal Prince Alfred Hospital (Australia); S. Eberl, Royal Prince Alfred Hospital (Australia) and The Univ. of Sydney (Australia); D. D. Feng, The Univ. of Sydney (Australia) and The Hong Kong Polytechnic Univ. (Hong Kong China) . . . . . [6144-141]

✔ **Segmentation of ground glass opacities by asymmetric multiphase deformable model,** Y. Yoo, SAMSUNG Advanced Institute of Technology (South Korea); H. Shim, Seoul National Univ. (South Korea); I. D. Yun, Hankuk Univ. of Foreign Studies (South Korea); K. W. Lee, S. U. Lee, Seoul National Univ. (South Korea) [6144-142]

✔ **Semi-automatic knee cartilage segmentation,** E. B. Dam, J. Folkesson, IT Univ. of Copenhagen (Denmark); P. Pettersen, C. Christiansen, Ctr. for Clinical and Basic Research (Denmark) [6144-144]

✔ **Fast and robust extraction of centerlines in 3D tubular structures using a scattered-snakelet approach,** C. T. Spuhler, M. Harders, G. Szekely, ETH Zürich (Switzerland) . . . . . [6144-145]

✔ **Analysis of brain images using the 3D-CSC segmentation method,** L. Priese, F. Schmitt, P. Sturm, H. Wang, Univ. Koblenz-Landau (Germany) . . . . . [6144-146]

✔ **3D echocardiographic segmentation using the mean-shift algorithm and an active surface model,** N. Felix-Gonzalez, R. Valdes-Cristerna, Univ. Autonoma Metropolitana-Iztapalapa (Mexico) . . . . . [6144-147]

✔ **Level sets and shape models for segmentation of cardiac perfusion MRI,** L. Lorenzo, R. S. MacLeod, R. T. Whitaker, G. Adluru, E. V. DiBella, Univ. of Utah . . . . . [6144-148]

✔ **Detection of joint space narrowing in hand radiographs,** J. A. Kauffman, K. Slump, Univ. Twente (Netherlands); H. Bernelot Moens, Hospital Group Twente (Netherlands) . . . . . [6144-149]

✔ **Vesselness propagation - A fast interactive vessel segmentation method,** W. Cai, Massachusetts General Hospital; F. Dachille, Viatronix Inc.; G. Harris, H. Yoshida, Massachusetts General Hospital . . . . . [6144-151]

✔ **Chroma analysis for quantitative immunohistochemistry using active learning,** N. V. Patel, Univ. of Michigan Dearborn; A. L. Ma, Oakland Univ.; R. Shah, Univ. of Michigan Dearborn; I. K. Sethi, Oakland Univ. . . [6144-152]

✔ **Probabilistic minimal path for automated esophagus segmentation,** M. Rousson, Siemens Corporate Research; Y. Bai, Johns Hopkins Univ.; C. Xu, F. Sauer, Siemens Corporate Research . . . . . [6144-153]

✔ **Variational segmentation framework in prolate spheroidal coordinates for 3D real time echocardiography,** B. Vallet, Columbia Univ.; E. D. Angelini, Ecole Nationale Supérieure des Télécommunications (France); A. F. Laine, Columbia Univ. . . . . [6144-154]

✔ **A new, general method of 3D model generation for active shape image segmentation,** S. Lim, Gwangju Institute of Science and Technology (South Korea); J. K. Udupa, A. D. Souza, D. A. Torigian, Univ. of Pennsylvania; Y. Jeong, Chonnam National Univ. Hospital (South Korea); Y. Ho, Gwangju Institute of Science and Technology (South Korea) . . . . . [6144-156]

✔ **A fast algorithm for body extraction in CT volumes,** G. Guetat, Univ. of Illinois at Urbana-Champaign; J. Stoeckel, M. Wolf, Siemens Medical Solutions . . . . . [6144-157]

✔ **Investigation on an EM framework for partial volume image segmentation,** D. Eremina, Stony Brook Univ.; X. Li, Columbia Univ.; Z. Liang, Stony Brook Univ. . . . . [6144-158]

✔ **Shortest path adjusted similarity metrics for resolving boundary perturbations in scaffold images for tissue engineering,** S. Rajagopalan, R. A. Robb, Mayo Clinic . . . . . [6144-159]

✔ **Intelligent data splitting for volume data,** H. Shen, Siemens Corporate Research; E. K. Bartsch, Siemens Medical Solutions (Germany) . . . . . [6144-160]

✔ **Single click volumetric segmentation of abdominal organs in computed tomography images,** N. J. Backman, Whitworth College; B. W. Whitney, Northern Kentucky Univ.; J. Furst, D. Raicu, DePaul Univ. . . . . [6144-161]

✔ **Fully automatic segmentation of left ventricular myocardium in real time 3D echocardiography,** V. S. Walimbe, The Ohio State Univ. and The Cleveland Clinic Foundation; V. Zagrodsky, The Cleveland Clinic Foundation; R. Shekhar, Univ. of Maryland/Baltimore . . . . . [6144-162]

✔ **Pre-operative segmentation of neck CT datasets for the planning of neck dissections,** J. Cordes, J. Dornheim, B. Preim, Otto-von-Guericke-Univ. Magdeburg (Germany); I. Hertel, G. Strauss, Hals-Nasen-Ohren-Universitätsklinikum of Leipzig (Germany) . . . . . [6144-163]

✔ **Brain extraction using geodesic active contours,** A. Huang, R. Abugharbieh, The Univ. of British Columbia (Canada); R. Tam, MS/MRI Research Group (Canada); A. Traboulsee, The Univ. of British Columbia (Canada) . . . [6144-164]

✔ **Unsupervised definition of the tibia-femoral joint regions on the human knee and its applications to cartilage analysisa,** J. G. Tamez-Peña, M. Barbu-McInnis, S. M. Totterman, VirtualScopics, LLC . . . . . [6144-165]

✔ **Binning strategies evaluation for tissue classification in computed tomography images,** D. S. Raicu, DePaul Univ.; S. Handrick, Arizona State Univ.; B. Naimipour, Univ. of Illinois at Chicago; J. D. Furst, DePaul Univ. . . . . [6144-166]

✔ **Interactive lesion segmentation on dynamic contrast enhanced breast MRI using a Markov model,** Q. Wu, The Univ. of Texas at Austin; M. Salganicoff, A. Krishnan, Simens Medical Solutions USA, Inc.; M. K. Markey, The Univ. of Texas at Austin . . . . . [6144-168]

✔ **Automatic tracking of neuro vascular tree paths,** S. Suryanarayanan, A. Gopinath, Y. Mallya, K. S. Shriram, GE India Technology Ctr. Pvt. Ltd. (India); M. C. Joshi, GE Healthcare . . . [6144-169]

✔ **Robust optic disk detection in retinal images using vessel structure and radon transform,** K. Huang, Michigan State Univ.; M. Yan, Siemens Corporate Research . . . . . [6144-170]

✔ **Prior-shape based segmentation of various objects in ultrasound images after speckle-reduction using level-set-based curvature evolution,** J. Dey, D. A. Tighe, G. Vijayaraghavan, Univ. of Massachusetts Medical School; V. Mitra, P. C. Pedersen, Worcester Polytechnic Institute . . . . . [6144-171]

✔ **Automatic pulmonary vessel segmentation in 3D computed tomographic pulmonary angiographic (CTPA) images,** C. Zhou, H. Chan, L. M. Hadjiiski, S. Patel, P. N. Cascade, B. Sahiner, J. Wei, J. Ge, E. A. Kazerooni, Univ. of Michigan . . . . . [6144-172]

✔ **Automated segmentation method of 3D MR brain image using iterative 3D morphological processing,** J. Park, B. Baek, Yonsei Univ. (South Korea); C. Ahn, K. Ku, D. K. Jeong, INFINITT Co. Ltd. (South Korea); C. Lee, Yonsei Univ. (South Korea) . . . . . [6144-173]

✔ **Unsupervised clustering of dynamic PET images on the projection domain,** M. E. Kamasak, B. Bayraktar, Purdue Univ. . [6144-174]

✔ **Quantification of liver fibrosis on MR images,** G. Motta, Bitfone Corp.; G. Bahl, R. Znamirowski, T. Hassanein, G. Bydder, C. B. Sirlin, Univ. of California/San Diego . . . . . [6144-175]

✔ **Content analysis of uterine cervix images: initial steps towards content based indexing and retrieval of cervigrams,** S. Gordon, G. Zimmerman, Tel Aviv Univ. (Israel); R. Long, S. Antani, National Library of Medicine; J. Jeronimo, National Cancer Institute; H. Greenspan, Tel Aviv Univ. (Israel) . . . . . [6144-176]

Shape

✔ **Topological analysis of 3D cell nuclei using finite element template-based spherical mapping,** E. Gladilin, Deutsches Krebsforschungszentrum (Germany); S. Goetze, J. M. Langerak, R. van Driel, Univ. van Amsterdam (Netherlands); K. Rohr, R. Eils, Deutsches Krebsforschungszentrum (Germany) . . . . . [6144-177]

✔ **Quantitative comparison of delineated structure shape in radiotherapy,** G. J. Price, C. J. Moore, Christie Hospital (United Kingdom) . . . [6144-178]

✔ **Sparse principal component analysis in medical shape modeling,** K. V. Skoglund, M. B. Stegmann, Danmarks Tekniske Univ. (Denmark) . . [6144-179]

✔ **3D reconstruction of the coronary tree from two x-ray angiographic views,** N. Sang, W. Peng, H. Li, T. Zhang, Huazhong Univ. of Science and Technology (China) . . . . . [6144-180]

✔ **Creation of 3D craniofacial standards from CBCT images,** K. Subramanyan, M. Palomo, M. G. Hans, Case Western Reserve Univ. . . . . [6144-182]

✔ **Quantifying torso deformity in scoliosis,** P. O. Ajemba, A. Kumar, N. G. Durdle, Univ. of Alberta (Canada); J. V. Raso, Glenrose Rehabilitation Hospital (Canada) . . . . . [6144-183]

Conference 6147
Ultrasonic Imaging and Signal Processing

✔ **Fully sampled, 3600 element, two dimensional transducer array for low cost C-scan imaging,** M. D. Eames, S. Zhou, J. A. Hossack, Univ. of Virginia . . . . . [6147-28]

✔ **Ultrasound image deconvolution in symmetrical mirror wavelet bases,** W. Yeoh, C. Zhang, M. Chen, M. Yan, Nanyang Technological Univ. (Singapore) . . . . . [6147-29]

✔ **Plane wave fast color flow mode imaging: parameter study,** I. Bolic, Danmarks Tekniske Univ. (Denmark); J. Udesen, Danmarks Tekniske Univ. (Denmark) and B-K Medical A/S (Denmark); F. Gran, J. A. Jensen, Danmarks Tekniske Univ. (Denmark) . . . . . [6147-30]

✔ **Comparison of fusion techniques for spatial compounding, with application to 3D breast ultrasound imaging,** P. Soler, Philips Medical Systems (France) and École Nationale Supérieure des Télécommunications (France); G. Delso, N. Villain, Philips Medical Systems (France); E. D. Angelini, I. Bloch, École Nationale Supérieure des Télécommunications (France) . . . . . [6147-31]

✔ **Coded excitation with sigma delta sampling for medical ultrasound imaging,** Y. M. Yoo, Univ. of Washington; J. Cao, L. M. Koh, Nanyang Technological Univ. (Singapore); Y. Kim, Univ. of Washington . . . . . [6147-32]

✔ **Freehand ultrasound calibration using the unscented Kalman filter,** M. H. Moghari, Queens Univ. (Canada); T. K. Chen, Queen's Univ. (Canada); P. Abolmaesumi, Queens Univ. (Canada) . . . . . [6147-33]

✔ **Functional and morphological ultrasonic biomicroscopy for tissue engineers,** S. Mallidi, S. R. Aglyamov, A. Karpiouk, S. Park, S. Y. Emelianov, The Univ. of Texas at Austin . [6147-34]

✔ **Tissue imaging utilizing the ultrasonic vibration potential,** S. Wang, C. Nguyen, S. Li, G. J. Diebold, Brown Univ. . . . . [6147-35]

✔ *For additional Posters see pp. 35-40 for the Tuesday/Wesnesday Poster Presentations.*

NOTE: Papers not removed at the designated times willl be considered UNWANTED and will be discarded. SPIE assumes no responsibility for posters left on the poster boards after the designated times.

Conference 6144
ROOM: Golden West

Monday-Thursday 13-16 Feb. 2006
Proceedings of SPIE Vol. 6144

Image Processing

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Posters for this conference have been divided into two separate sessions, with one session on Sunday/Monday and one on Tuesday/Wednesday. See pages 15-20 and 33-38 for listings. All posters will be on display in the Grand Ballroom. Receptions, with authors in attendance at his or her poster, will be on Monday and Wednesday evenings from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

(ST) = Short Talk–Presenters have been selected to prepare short ten-minute presentations.

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Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 5

RM: San Diego . . . . Mon. 8:00 to 9:40 am

Ultrasound

Chair: **Robert L. Galloway, Jr.**, Vanderbilt Univ.

8:00 am: **Percutaneous scaphoid pinning using ultrasound guidance,** M. Beek, P. Abolmaesumi, T. K. Chen, R. Sellens, D. Pichora, Queen's Univ. (Canada) . . . . . [6141-23]

8:20 am: **A hybrid deformable model for virtual reality simulation of prostate brachytherapy,** D. I. Levin, The Univ. of Western Ontario (Canada); A. Fenster, Robarts Research Institute (Canada); H. M. Ladak, The Univ. of Western Ontario (Canada) . . [6141-24]

8:40 am: **A comparison study assessing the feasibility of ultrasound-initialized deformable bone models,** H. Talib, K. T. Rajamani, J. Kowal, Univ. Bern (Switzerland); M. A. Styner, Univ. of North Carolina/ Chapel Hill; M. A. Gonzalez Ballester, Univ. Bern (Switzerland) . . . [6141-25]

9:00 am: **3D segmentation of kidney tumors from freehand 2D ultrasound,** A. Ahmad, Robarts Research Institute (Canada); T. M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) . . . . . [6141-26]

9:20 am: **3D ultrasound image guidance system used in RF uterine adenoma and uterine bleeding ablation system,** M. Ding, X. Luo, C. Cai, C. Zhou, Huazhong Univ. of Science and Technology (China); A. Fenster, Robarts Research Institute (Canada) . . . . . [6141-27]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 5

RM: Town & Country Mon. 8:00 to 9:40 am

Optical and MR Imaging

Chair: **Harrison H. Barrett**, The Univ. of Arizona

8:00 am: **Impact of noise-on-image reconstruction for diffuse optical tomography,** T. Nielsen, T. Köhler, Philips Research Labs. (Germany) . . . . . [6142-22]

8:20 am: **High-resolution multiphoton optical tomography of tissues: an in vitro and in vivo study,** I. Riemann, Fraunhofer-Institut für Biomedizinische Technik (Germany); K. Schenke-Layland, Univ. of California/Los Angeles; A. Ehlers, Fraunhofer-Institut für Biomedizinische Technik (Germany); E. Dimitrow, M. Kaatz, P. Elsner, Friedrich-Schiller-Univ. Jena (Germany); S. Martin, JenLab GmbH (Germany); K. König, Fraunhofer-Institut für Biomedizinische Technik (Germany) . . . . . [6142-23]

8:40 am: **Generalized auto-calibrating technique for image reconstruction from sensitivity encoded MRI data,** E. G. Kholmovski, D. L. Parker, The Univ. of Utah . . . . . [6142-24]

9:00 am: **Reducing temporal fluctuations in MRI with the multichannel method SENSE,** S. Moeller, P. Van de Moortele, K. Ugurbil, Univ. of Minnesota [6142-25]

9:20 am: **Description of statistical theory of magnetic resonance imaging,** T. Lei, Univ. of Pennsylvania . . . . . [6142-26]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 5

RM: California . . . . Mon. 8:00 to 9:40 am

Lung Imaging

Chair: **Eric A. Hoffman**, Univ. of Iowa Hospitals and Clinics

8:00 am: **Effect of mixing scanner types and reconstruction kernels on the characterization of lung parenchymal pathologies: emphysema, interstitial pulmonary fibrosis and normal non-smokers,** Y. Xu, E. van Beek, M. Sonka, J. Guo, G. McLennan, E. A. Hoffman, The Univ. of Iowa . . . . . [6143-22]

8:20 am: **A novel multipurpose tree and path matching algorithm with application to airway trees,** J. N. Kaftan, RWTH Aachen (Germany); A. P. Kiraly, Siemens Corporate Research; D. P. Naidich, New York Univ.; C. L. Novak, Siemens Corporate Research . . . . . [6143-23]

8:40 am: **Point-based methods for automatic bronchial tree matching and labeling,** T. Bülow, C. Lorenz, R. Wiemker, Philips Research Labs. (Germany); J. Honko, Brandenburgische Technische Univ. Cottbus (Germany) . . . . . [6143-24]

9:00 am: **Quantification of tumor mobility during the breathing cycle using 3D dynamic MRI,** M. Schoebinger, C. Plathow, I. Wolf, H. Kauczor, H. Meinzer, German Cancer Research Ctr. (Germany) . . . . . [6143-25]

9:20 am: **Automated airway evaluation system using airway lumen diameter, airway wall thickness and broncho-arterial ratio with multi-slice computed tomography,** B. L. Odry, A. Kiraly, C. Novak, Siemens Corporate Research; D. Naidich, New York Univ. Medical Ctr.; J. Lerallut, Univ. de Technologie de Compiegne (France) . . . . . [6143-26]

Coffee Break . . . . . 9:40 to 10:10 am

6143 continues on page 24

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 1

RM: Golden West . . Mon. 8:00 to 9:40 am

Segmentation I

Chair: **Andreas Wahle**, The Univ. of Iowa

8:00 am: **Image segmentation using local shape and gray-level appearance models,** D. Seghers, D. Loeckx, F. Maes, P. Suetens, Katholieke Univ. Leuven (Belgium) . . . . . [6144-01]

8:20 am: **Towards fully automatic object detection and segmentation,** H. Schramm, O. Ecabert, J. Peters, V. Philomin, J. Weese, Philips Research Labs. (Germany) . . . . . [6144-02]

8:40 am: **Automatic generation of dynamic 3D models for medical segmentation tasks,** L. Dornheim, J. Dornheim, K. D. Tönnies, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . [6144-03]

9:00 am: **Oriented active shape models,** J. Liu, J. K. Udupa, Univ. of Pennsylvania . . . . . [6144-04]

9:20 am: **Segmentation by surface-to-image registration,** Z. Xie, VirtualScopics LLC; P. Chiao, Pfizer Inc.; J. Tamez-Pena, VirtualScopics LLC; S. Liachenko, S. Dhamija, M. Gieseg, Pfizer Inc. . . . . [6144-05]

Coffee Break . . . . . 9:40 to 10:10 am

6144 continues on page 24

Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 6

RM: San Diego Mon. 10:10 am to 12:10 pm

Keynote and Display

Chair: **Kevin R. Cleary**, Georgetown Univ.

Keynote

10:10 am: **Visualization and image-guided procedures in medicine: a retrospective and prospective view,** R. A. Robb, Mayo Clinic . . . . . [6141-28]

11:10 am: **Temporal response measurements of medical liquid crystal displays,** H. Liang, A. Badano, U.S. Food and Drug Administration . . . . . [6141-29]

11:30 am: **Performance evaluation of a commercial system for quantitative measurement of display resolution and noise,** E. W. Cleland, Smith College; E. Samei, Duke Univ. [6141-30]

11:50 am: **Optimizing the image contrast on the softcopy liquid-crystal displays using error diffusion,** J. Fan, H. Roehrig, M. K. Sundareshan, E. A. Krupinski, The Univ. of Arizona . . . . . [6141-31]

Lunch Break . . . . . 12:10 to 1:20 pm

6141 continues on page 25

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 6

RM: Town & Country Mon. 10:10 am to 12:10 pm

X-ray Imaging Detectors I

Chair: **John A. Rowlands**, Sunnybrook and Women's Health Sciences Ctr. (Canada)

10:10 am: **Performance evaluation of a dual-crystal APD-based detector module for positron emission tomography,** C. M. Pepin, P. Bérard, J. M. Cadorette, M. Tétrault, J. Leroux, J. Michaud, S. Robert, Univ. de Sherbrooke (Canada); H. Dautet, M. Davies, PerkinElmer Optoelectronics (Canada); R. Fontaine, R. M. Lecomte, Univ. de Sherbrooke (Canada) . . . . . [6142-27]

10:30 am: **High voltage protection in active matrix flat-panel imagers,** J. Lehnert, W. Zhao, Stony Brook Univ. . . . . [6142-28]

10:50 am: **Low-noise pixel architecture for advanced diagnostic medical x-ray imaging applications,** M. H. Izadi, K. S. Karim, Simon Fraser Univ. (Canada); A. Nathan, Univ. of Waterloo (Canada); J. A. Rowlands, Sunnybrook and Women's Health Sciences Ctr. (Canada) . . . . [6142-29]

11:10 am: **A new 2D-tiled detector for multislice CT,** R. P. Luhta, M. A. Chappo, B. Harwood, R. A. Mattson, C. J. Vrettos, Philips Medical Systems . . . . . [6142-30]

11:30 am: **Novel CT detector based on an inorganic scintillator working in photon-counting mode,** P. Bérard, C. M. Pepin, D. M. Rouleau, J. M. Cadorette, R. Fontaine, R. M. Lecomte, Univ. de Sherbrooke (Canada) . . . . . [6142-31]

11:50 am: **Three-dimensional columnar CsI model for x-ray imaging system simulations using MANTIS: validating for noise, blur, and light output,** A. Badano, I. S. Kyprianou, U.S. Food and Drug Administration; J. Sempau, Univ. Politècnica de Catalunya (Spain) . . . . . [6142-32]

Lunch Break . . . . . 12:10 to 1:20 pm

6142 continues on page 25

Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 6

RM: California Mon. 10:10 am to 12:10 pm

MRI Analysis

Chair: **Xiaoping P. Hu**, Emory Univ.

10:10 am: **3D automatic segmentation of MR images applied to the rat uterus,** A. Akselrod-Ballin, E. Eyal, M. Galun, E. Furman-Haran, Weizmann Institute of Science (Israel); M. J. Gomori, Hadassah Univ. Medical Ctr. (Israel); R. Basri, H. Degani, A. Brandt, Weizmann Institute of Science (Israel) . . . . . [6143-27]

10:30 am: **Semi-automatic segmentation and quantification of 3D spinal cord data,** R. Van Uitert, I. Bitter, J. A. Butman, National Institutes of Health . . . . . [6143-28]

10:50 am: **Quantification of diffusion weighted images (DWI) and apparent diffusion coefficient maps (ADC) in the detection of acute stroke,** P. K. Tulipano, W. S. Millar, C. Imielinska, X. Liu, Columbia Univ.; J. Rosiene, Eastern Connecticut State Univ.; M. Sughrue, A. D'Ambrosio, Columbia Univ. . . . . [6143-29]

11:10 am: **Feasibility study on quantitative analysis of multiple sclerosis,** L. Li, State Univ. of New York at Stony Brook; X. Li, Univ. of Pittsburgh; X. Wei, D. Sturm, R. R. Goldberg, City Univ. of New York; H. Lu, Z. Liang, State Univ. of New York at Stony Brook . . . . . [6143-30]

11:30 am: **A methodology to study multiple sclerosis based on distributions of standardized intensities in segmented tissue regions,** T. Lei, J. K. Udupa, L. Balcer, E. Schwartz, G. Wu, S. Mishra, D. Odhner, L. Desiderio, Univ. of Pennsylvania . . . . . [6143-31]

11:50 am: **Micro-MRI-based image acquisition and processing system for assessing the response to therapeutic intervention,** B. Vasilic, G. A. Ladinsky, P. K. Saha, F. W. Wehrli, Univ. of Pennsylvania Medical Ctr. . . . . [6143-32]

Lunch Break . . . . . 12:10 to 1:20 pm

6143 continues on page 25

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 2

RM: Golden West Mon. 10:10 am to 12:10 pm

Segmentation II

Chair: **Colin Studholme**, Univ. of California/San Francisco

10:10 am: **Robust local intervertebral disc alignment for spinal MRI,** J. G. Reisman, J. Hoeppner, Siemens Corporate Research; S. Huang, National Tsing Hua Univ. (Taiwan); L. Zhang, Siemens Corporate Research; S. Lai, National Tsing Hua Univ. (Taiwan); C. L. Novak, Siemens Corporate Research . . . . . [6144-06]

10:30 am: **Level set based vertebra segmentation for the evaluation of Ankylosing Spondylitis,** S. Tan, J. Yao, M. M. Ward, L. Yao, R. M. Summers, National Institutes of Health [6144-07]

10:50 am: **Segmentation of hand radiographs using fast-marching methods,** H. Chen, Michigan State Univ.; C. L. Novak, Siemens Corporate Research . . . . . [6144-08]

11:10 am: **Knowledge-based segmentation of the heart from respiratory-gated CT datasets acquired without cardiac contrast-enhancement,** J. Dey, Univ. of Massachusetts Medical School; T. Pan, The Univ. of Texas M.D. Anderson Cancer Ctr.; D. J. Choi, M. Smyczynski, P. H. Pretorius, M. A. King, Univ. of Massachusetts Medical School . . . . . [6144-09]

11:30 am: **Automatic cardiac MRI myocardium segmentation using graphcut,** G. Kedenburg, Univ. Hamburg (Germany); C. A. Cocosco, Philips Research Labs. (Germany); U. Koethe, Univ. Hamburg (Germany); W. J. Niessen, Erasmus Univ. Medical Ctr. (Netherlands); E. P. Vonken, M. A. Viergever, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . [6144-10]

11:50 am: **Anatomical-based segmentation with stenosis bridging and gap closing in atherosclerotic cardiac MSCT,** R. D. Merges, Siemens Medical Solutions (Germany) and Univ. Karlsruhe (Germany); D. Rinck, Siemens Medical Solutions (Germany); O. Dössel, Univ. Karlsruhe (Germany); M. Scheuering, Siemens Medical Solutions (Germany) . . . . . [6144-11]

Lunch Break . . . . . 12:10 to 1:20 pm

6144 continues on page 25

Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 7

Room: San Diego . . Mon. 1:20 to 3:00 pm

Modeling

Chairs: **Frank Sauer**, Siemens Corporate Research; **Jay B. West**, Accuray Inc.

1:20 pm: **Image stabilisation of the beating heart by local linear interpolation,** M. Groeger, G. Hirzinger, DLR (Germany) . . . . . [6141-32]

1:40 pm: **Exponential elastic model and its application in real-time simulation,** H. Zhong, T. M. Peters, Robarts Research Institute (Canada) . . . . . [6141-33]

2:00 pm: **Pre-operative simulation and post-operative validation of soft-tissue deformations for breast implantation planning,** L. Roose, Katholieke Univ. Leuven (Belgium); W. De Maerteleire, 3D Medical BV (Netherlands); W. Mollemans, F. Maes, P. Suetens, Katholieke Univ. Leuven (Belgium) . . . . . [6141-34]

2:20 pm: **An optimal three-stage method for anatomical shape reconstruction from sparse information using a dense surface point distribution model,** G. Zheng, K. T. Rajamani, Univ. Bern (Switzerland) . . . . . [6141-36]

2:40 pm: **Magnetic resonance elastography: an emerging imaging modality for visualizing the viscoelastic properties within soft tissues,** M. M. Doyley, J. B. Weaver, F. E. Kennedy, Dartmouth Medical School and Dartmouth College; K. D. Paulsen, Dartmouth College [6141-35]

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

6141 continues on page 26

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 7

RM: Town & CountryMon. 1:20 to 3:20 pm

X-ray CT: Systems

Chair: **Bruce R. Whiting**, Washington Univ. in St. Louis

1:20 pm: **Evaluation of noise and resolution properties of a penalized-likelihood CT sinogram restoration algorithm,** P. J. La Rivière, P. Vargas, The Univ. of Chicago . . . . . [6142-33]

1:40 pm: **Comparison of three sinogram restoration methods,** P. Forthmann, T. Köhler, Philips GmbH (Germany); M. Defrise, Vrije Univ. Brussel (Belgium); P. J. La Rivière, The Univ. of Chicago . . . . . [6142-34]

2:00 pm: **Investigation of image lag in a newly built high-speed flat-panel detector-based cone-beam CT imaging system,** Y. Zhang, R. Ning, D. L. Conover, Univ. of Rochester . . . . . [6142-35]

2:20 pm: **Design and development of C-arm based cone-beam CT for image-guided interventions,** G. Chen, J. Zambelli, B. E. Nett, M. P. Supanich, S. Leng, T. Zhuang, Univ. of Wisconsin/Madison; C. Riddell, B. F. Belanger, GE Healthcare; C. A. Mistretta, Univ. of Wisconsin/Madison . . . . . [6142-36]

2:40 pm: **A novel cone beam CT breast-imaging scanner: preliminary system evaluation,** R. Ning, D. L. Conover, Y. Yu, J. Cullinan, L. Shiffhauer, Y. Zhang, X. Lu, Univ. of Rochester . . . . . [6142-37]

3:00 pm: **Z-scan cone-beam CT,** G. Chen, Univ. of Wisconsin/Madison . . . . . [6142-38]

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

6142 continues on page 26

Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 7

RM: CaliforniaMon. 1:20 to 3:20 pm

Mechanical Properties

Chair: **Armando Manduca**, Mayo Clinic

1:20 pm: **Functional microimaging: an integrated approach for bone biomechanics,** R. Voide, H. G. van Lenthe, P. Schneider, J. Snedeker, M. Stauber, R. Mueller, ETH Zürich (Switzerland) . . . . . [6143-33]

1:40 pm: **MR elastographic methods for the evaluation of plantar fat pads: preliminary comparison of the shear modulus for shearing deformation and compressive deformation in normal subjects,** J. B. Weaver, T. B. Miller, P. R. Perrinez, M. M. Doyley, H. Wang, Y. Y. Cheung, J. S. Wobel, F. E. Kennedy, K. D. Paulsen, Dartmouth College [6143-35]

2:00 pm: **Imaging mechanical properties of hepatic tissue with magnetic resonance elastography,** M. Yin, O. Rouviere, L. J. Burgart, J. L. Fidler, A. Manduca, R. L. Ehman, Mayo Clinic . . . . . [6143-34]

2:20 pm: **Application of multiresolution modality independent elastography for detection of multiple anomalous objects,** J. Ou, S. Barnes, M. Miga, Vanderbilt Univ. . . . . [6143-36]

2:40 pm: **Biomechanical registration of prostate images using statistical shape models,** P. R. Courtis, A. Samani, The Univ. of Western Ontario (Canada) . . . . . [6143-37]

3:00 pm: **A multi-organ biomechanical model to analyze prostate deformation due to large deformation of the rectum,** K. K. Brock, C. Menard, J. Hensel, D. A. Jaffray, Univ. of Toronto (Canada) . . . . . [6143-38]

6143 continues on page 26

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 3

RM: Golden West . . Mon. 1:20 to 3:00 pm

Texture

Chair: **Stephen Aylward**, Univ. of North Carolina/Chapel Hill

1:20 pm: **Quantifying changes in the bone microarchitecture using Minkowski-functionals and scaling vectors: a comparative study,** C. W. Raeth, Max-Planck-Institut für extraterrestrische Physik (Germany); D. Mueller, Technische Univ. München (Germany); T. Link, Univ. of California/San Francisco; H. F. Boehm, Ludwig-Maximilians-Univ. München (Germany); R. Monetti, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6144-12]

1:40 pm: **Variogram methods for texture classification,** O. M. Jeromin, M. Pattichis, Univ. of New Mexico; C. S. Pattichis, E. Kyriacou, Univ. of Cyprus; A. Nicolaides, Cardiovascular Disease Educational and Research Trust (Cyprus) and Imperial College (United Kingdom) and Univ. of Cyprus (Cyprus) . . . . . [6144-13]

2:00 pm: **Optimizing texture measures quantifying bone structures as well as MR-sequences at 3 Tesla: an integrative statistical approach,** C. W. Raeth, Max-Planck-Institut für extraterrestrische Physik (Germany); D. Mueller, E. Rummeny, Technische Univ. München (Germany); T. Link, Univ. of California/San Francisco; M. Vogel, H. König, General Electric Co. (Germany); H. Boehm, Ludwig-Maximilians-Univ. München (Germany); R. Monetti, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6144-17]

2:20 pm: **Analysis of parenchymal patterns using conspicuous spatial frequency features in mammograms and applied to the BI-RADS density rating scheme,** P. Perconti, U.S. Army Night Vision & Electronic Sensors Directorate; M. Loew, The George Washington Univ. . . . . [6144-15]

2:40 pm: **(ST) Mammographic density measured as changes in tissue structure caused by HRT,** J. Raundahl, M. Loog, M. Nielsen, IT-Univ. i Kobenhavn (Denmark) . . . . . [6144-16]

2:50 pm: **(ST) Early detection of glaucoma using fully automated disparity analysis of the optic nerve head (ONH) from stereo fundus images,** A. Sharma, E. Corona, S. Mitra, B. S. Nutter, Texas Tech Univ. . . . . [6144-201]

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

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Best Student Paper Award and Plenary Presentation

Town & Country Room · 4:00 to 5:30 pm

Chair: **Eliot L. Siegel,** Univ. of Maryland

Michael B. Merickel Student Paper Award

4:00 to 4:05 pm

Plenary Presentation

Electrical Impedance Imaging: an Idea Whose Time May Soon Come

Jonathan C. Newell, Ph.D., Rensselaer Polytechnic Institute

Please join us for a poster reception from 5:30 to 7:00 pm this evening in the Grand Ballroom. Poster awards will be presented at 6:30 pm.

Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 8

Room: San Diego . Tues. 8:00 to 9:20 am

Navigation and Localization

Chair: **Terence M. Peters**, Robarts Research Institute (Canada)

8:00 am: **Integration of real-time X-ray fluoroscopy, rotational X-ray imaging and real-time catheter tracking for improved navigation in interventional cardiac electrophysiology procedures,** R. M. Manzke, R. Chan, Philips Research Labs.; G. Shechter, Philips Medical Systems Technologies Ltd. (Israel); S. Sokka, Philips Research Labs.; D. Stanton, Philips Electronics North America; Z. J. Malchano, Massachusetts General Hospital; V. Rasche, Philips Medical Systems; V. Reddy, Massachusetts General Hospital . . . . . [6141-37]

8:20 am: **Targeted endo-myocardial injections of stem cells using fused MRI and X-ray guidance,** L. F. Gutiérrez, R. DeSilva, E. R. McVeigh, C. R. Ozturk, R. J. Lederman, NHLBI/National Institutes of Health . . . . . [6141-38]

8:40 am: **Endoscopic navigation system using 2D/3D registration,** J. B. Hummel, M. Figl, W. Birkfellner, H. Bergmann, Medizinische Univ. Wien (Austria) . . . . . [6141-39]

9:00 am: **Minimization of optical tool tracking error using fulcrum correction in minimally invasive interventions with application to prostate biopsy procedure,** D. W. Cool, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); S. Shi, D. B. Downey, Robarts Research Institute (Canada); J. Izawa, London Health Sciences Ctr. (Canada); T. M. Peters, A. Fenster, Robarts Research Institute (Canada) [6141-40]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 8

RM: Town & CountryTues. 8:00 to 9:40 am

Innovative Imaging

Chair: **Jiang Hsieh**, GE Healthcare

8:00 am: **Application of x-ray computed tomography based on the refraction contrast to biomedicine,** E. Hashimoto, Graduate Univ. for Advanced Studies (Japan); A. S. Maksimenko, H. Sugiyama, M. Ando, Institute for Material Structure Science (Japan); Y. Nishino, I. Tetsuya, The Institute of Physical and Chemical Research (Japan) . . . . . [6142-39]

8:20 am: **3D cryo-section/imaging of blood vessel lesions for validation of MRI data,** O. Salvado, D. Roy, M. Heinzel, E. McKinley, D. Wilson, Case Western Reserve Univ. [6142-40]

8:40 am: **Performances of different reflectance and diffuse optical tomographic approaches in fluorescence molecular imaging of small animals,** J. Dinten, P. Peltie, A. Da Silva, J. Boutet, A. Koenig, L. Herve, M. Berger, A. Laidevant, P. Rizo, CEA-LETI (France) . [6142-41]

9:00 am: **Image quality assessment of a pre-clinical flat-panel volumetric micro-CT scanner,** L. Y. Du, D. W. Holdsworth, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); T. Lee, Robarts Research Institute (Canada) . . . . . [6142-42]

9:20 am: **Rotating slat collimator design for high-energy near-field imaging,** A. C. Sharma, C. E. Floyd, Jr., B. P. Harrawood, G. D. Tourassi, A. J. Kapadia, J. E. Bender, J. Y. Lo, C. Howell, Duke Univ. . . . . [6142-43]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 8

RM: California . . . Tues. 8:00 to 9:40 am

Virtual Endoscopy I: Virtual Bronchoscopy and Related Methods

Chair: **Ronald M. Summers**, National Institutes of Health

8:00 am: **Real-time CT-video registration for continuous endoscopic guidance,** S. A. Merritt, L. Rai, W. E. Higgins, The Pennsylvania State Univ. . . . . [6143-39]

8:20 am: **Branch identification method for CT-guided bronchoscopy based on eigenspace image matching between real and virtual bronchoscopic images,** K. Mori, R. Shinohara, D. Deguchi, T. Kitasaka, Y. Suenaga, Nagoya Univ. (Japan); H. Takabatake, Minami Sanjyo Hospital (Japan); M. Mori, Sapporo Kosei Hospital (Japan); H. Natori, Sapporo Medical Univ. (Japan) . . . . . [6143-40]

8:40 am: **Synchronous navigation for CT colonography,** A. Huang, R. M. Summers, D. Roy, National Institutes of Health . . . . . [6143-41]

9:00 am: **Virtual cardioscopy: interactive endocardial visualization to enhance accuracy of RF cardiac ablation,** D. R. Holmes III, M. E. Rettman, B. M. Cameron, J. J. Camp, R. A. Robb, Mayo Clinic . . . . . [6143-42]

9:20 am: **Fast and accurate tract unfolding based on stable volumetric image deformation,** T. Truong, T. Kitasaka, K. Mori, Y. Suenaga, Nagoya Univ. (Japan) . . . . . [6143-43]

Coffee Break . . . . . 9:40 to 10:10 am

6143 continues on page 27

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 4

RM: Golden West . Tues. 8:00 to 9:40 am

Segmentation III

Chair: **Julia A. Schnabel**, King's College London (United Kingdom)

8:00 am: **Automatic segmentation of vessels in breast MR as a false positive elimination technique for lesion detection and segmentation using the shape tensor,** G. Hermosillo, Siemens Medical Solutions USA, Inc.; X. Jiang, Univ. of Iowa . . . . . [6144-18]

8:20 am: **A dorsolateral prefrontal cortex semi-automatic segmenter,** R. Al-Hakim, Georgia Institute of Technology; J. J. Fallon, Univ. of California/Irvine; D. Nain, J. Melonakos, A. R. Tannenbaum, Georgia Institute of Technology . . . . . [6144-19]

8:40 am: **Competitive segmentation of the hippocampus and the amygdala from MRI data: validation on young healthy controls and Alzheimer's disease patients,** M. Chupin, Univ. College London (United Kingdom) and Hôpital de la Salpêtrière (France); D. Hasboun, R. Mukuna-Bantumbakulu, E. Bardinet, S. Baillet, S. R. Kinkingnehun, Hôpital de la Salpêtrière (France); L. Lemieux, Univ. College London (United Kingdom); B. Dubois, INSERM (France); L. Garnero, Hôpital de la Salpêtrière (France) . . . . . [6144-20]

9:00 am: **Improved 3D live-wire segmentation for 3D CT chest image analysis,** K. Lu, W. E. Higgins, The Pennsylvania State Univ. . . [6144-21]

9:20 am: **(ST) Automatic segmentation of pulmonary nodules on CT images by use of NCI lung image database consortium,** R. Tachibana, S. Kido, Yamaguchi Univ. (Japan) . . . . . [6144-22]

9:30 am: **(ST) Automatic segmentation of pulmonary fissures in X-ray CT images using anatomic guidance,** S. Ukil, M. Sonka, J. M. Reinhardt, The Univ. of Iowa . . . . . [6144-23]

Coffee Break . . . . . 9:40 to 10:10 am

6144 continues on page 27

Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 9

RM: San Diego Tues. 10:10 am to 12:10 pm

Registration, Modeling, and Segmentation

Chair: **David R. Holmes III**, Mayo Clinic

10:10 am: **Rapid registration of multimodal images using a reduced number of voxels,** X. Huang, N. A. Hill, Robarts Research Institute (Canada); J. Ren, The Univ. of Western Ontario (Canada); T. M. Peters, Robarts Research Institute (Canada) [6141-42]

10:30 am: **A piecewise function-to-structural registration algorithm for image-guided cardiac catheter ablation,** Y. Su, D. R. Holmes III, M. E. Rettmann, R. A. Robb, Mayo Clinic . . . . . [6141-43]

10:50 am: **3D soft tissue prediction with a tetrahedral mass tensor model for a maxillofacial planning system: a quantitative validation study,** W. Mollemans, F. Schutyser, Katholieke Univ. Leuven (Belgium); N. Nadjmi, Eeuwfeestkliniek Antwerpen (Belgium); F. Maes, P. Suetens, Katholieke Univ. Leuven (Belgium) . . . . . [6141-44]

11:10 am: **A laplace equation approach for shape comparison,** E. Pichon, D. Nain, M. Niethammer, Georgia Institute of Technology . . . . . [6141-45]

11:30 am: **Automatic anatomical segmentation of the liver by separation planes,** D. Boltcheva, N. Passat, Univ. Louis Pasteur (France); V. Agnus, IRCAD (France); M. Jacob-Da Col, C. Ronse, Univ. Louis Pasteur (France); L. Soler, IRCAD (France) . . . . . [6141-46]

11:50 am: **Tumor volume measurement and volume comparison plug-ins for ITK,** T. R. Popa, Georgetown Univ.; L. Ibanez, Kitware Inc.; E. Levy, K. R. Cleary, Georgetown Univ. . . . . [6141-47]

Lunch/Exhibition Break 12:10 to 1:20 pm

6141 continues on page 28

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 9

RM: Town & Country Tues. 10:10 am to 12:10 pm

X-ray Imaging

Chair: **Michael Overdick**, Philips Research Labs. (Germany)

10:10 am: **Spatial x-ray gating: a tool for automated regional x-ray exposure management,** D. V. Yatsenko, L. Anderton, GE Healthcare; K. Sikorski, R. M. Kirby, The Univ. of Utah . . . . . [6142-44]

10:30 am: **Applying a proposed definition for receptor dose to digital projection images,** R. Van Metter, J. Yorkston, Eastman Kodak Co. . . . . [6142-45]

10:50 am: **The impact of angular separation on the performance of biplane correlation imaging for lung nodule detection,** N. Majdi Nasab, E. Samei, Duke Univ. . . . . [6142-46]

11:10 am: **Evaluation of a physical based approach of correction of scatter radiation in thorax cone beam CT,** J. Rinkel, L. Gerfault, CEA-LETI (France); F. Estève, INSERM (France); J. Dinten, CEA-LETI (France) . . . . . [6142-47]

11:30 am: **Scatter correction for cone-beam computed tomography using simulated object models,** M. Bertram, J. Wiegert, G. Rose, Philips Research Labs. (Germany) . . . . . [6142-48]

11:50 am: **Development of next generation digital flat panel catheterization system: design principles and validation methodology,** B. F. Belanger, P. Gopinath, GE Healthcare; P. Dhawale, F. Betraoui, B. Vagvolgyi, GE Healthcare France (France) . . . . . [6142-49]

Lunch/Exhibition Break 12:10 to 1:20 pm

Conference 6142 oral program resumes Wednesday, 8:00 am

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Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 9

RM: California Tues. 10:10 am to 12:10 pm

Virtual Endoscopy II: Polyp Detection and Analysis for CT Colonography

Chair: **William E. Higgins**, The Pennsylvania State Univ.

10:10 am: **Effects of filtering on colorectal polyp detection in ultra-low dose CT,** G. A. Schoonenberg, Technische Univ. Eindhoven (Netherlands) and Philips Medical Systems (Netherlands); A. de Vries, Academisch Medisch Centrum Amsterdam (Netherlands); S. Grigorescu, J. Peters, Philips Medical Systems (Netherlands); A. Vilanova, Technische Univ. Eindhoven (Netherlands); R. Truyen, Philips Medical Systems (Netherlands); F. Gerritsen, Philips Medical Systems (Netherlands) and Technische Univ. Eindhoven (Netherlands) . . . [6143-44]

10:30 am: **Automatic procedure to distinguish colonic polyps located on fold vs. not on fold,** M. Franaszek, R. M. Summers, National Institutes of Health; P. J. Pickhardt, Univ. of Wisconsin/Madison; J. R. Choi, Uniformed Services Univ. of the Health Sciences and Walter Reed Army Medical Ctr. . . . . [6143-45]

10:50 am: **Performance tuning of candidate determination methods for computer aided detection of colon polyps,** I. Bitter, M. D. Kelsey, R. M. Summers, National Institutes of Health . . . . . [6143-46]

11:10 am: **Quantitative assessment of colon distention for polyp detection in CT virtual colonoscopy,** R. Van Uitert, I. Bitter, R. M. Summers, National Institutes of Health; J. R. Choi, Uniformed Services Univ. of the Health Sciences and Walter Reed Army Medical Ctr.; P. J. Pickhardt, Univ. of Wisconsin/Madison . . . . . [6143-47]

11:30 am: **A method for generating virtual unfolded view of colon using spring model,** M. Oda, Y. Hayashi, T. Kitasaka, K. Mori, Y. Suenaga, Nagoya Univ. (Japan) . . . . . [6143-48]

11:50 am: **Geometric modeling, functional parameter calculation, and visualization of the in-vivo distended rectal wall,** C. R. Haider, A. Manduca, R. A. Robb, S. J. Riederer, A. E. Bharucha, Mayo Clinic [6143-49]

Lunch/Exhibition Break 12:10 to 1:20 pm

6143 continues on page 28

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 5

RM: Golden West Tues. 10:10 am to 12:10 pm

Multiresolution and Wavelets

Chair: **Philippe Thévenaz**, École Polytechnique Fédérale de Lausanne (Switzerland)

Keynote

10:10 am: **PET molecular imaging biomarkers for molecular therapeutics,** M. E. Phelps, Univ. of California/Los Angeles . . [6144-24]

11:10 am: **A pseudo wavelets-based method for accurate tagline tracing on tagged MR images of the tongue,** X. Yuan, C. Ozturk, G. Chi-Fishman, National Institute of Health . [6144-25]

11:30 am: **An improved method of wavelet image fusion for extended depth-of-field microscope imaging,** S. Cheng, Q. Wu, Advanced Digital Imaging Research, LLC; H. Choi, The Univ. of Texas at Austin; K. R. Castleman, Advanced Digital Imaging Research, LLC . . . [6144-26]

11:50 am: **Three-band MRI image fusion utilizing the wavelet-based method optimized with two quantitative fusion metrics,** Y. Zheng, A. S. Elmaghraby, H. Frigui, Univ. of Louisville . . . . . [6144-27]

Lunch/Exhibition Break 12:10 to 1:20 pm

6144 continues on page 28

Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 10

Room: San Diego . Tues. 1:20 to 3:00 pm

Neurosurgery

Chair: **Michael I. Miga**, Vanderbilt Univ.

1:20 pm: **XFEM-based modeling of successive resections for preoperative image updating,** L. M. Vigneron, P. A. Robe, Univ. de Liège (Belgium); S. K. Warfield, Brigham and Women's Hospital; J. G. Verly, Univ. de Liège (Belgium) . . . . . [6141-48]

1:40 pm: **Comparative study of brain deformation estimation methods,** F. Liu, K. D. Paulsen, K. E. Lunn, Dartmouth College; H. Sun, Dartmouth Hitchcock Medical Ctr.; A. Hartov, Z. Wu, Dartmouth College; D. W. Roberts, Dartmouth Hitchcock Medical Ctr. . . . . [6141-49]

2:00 pm: **Integration of patient specific modeling and advanced image processing techniques for image-guided neurosurgery,** N. Archip, Harvard Medical School; A. Fedorov, The College of William & Mary; B. Lloyd, Harvard Medical School; N. Chrisochoides, The College of William & Mary; A. Golby, P. M. Black, Harvard Medical School; S. K. Warfield, Brigham and Women's Hospital . . . . . [6141-50]

2:20 pm: **Automated brain shift correction using a pre-computed deformation atlas,** P. Dumpuri, T. K. Sinha, B. M. Dawant, R. L. Galloway, Jr., M. I. Miga, Vanderbilt Univ. . . . . [6141-51]

2:40 pm: **Replacing the surgical microscope,** H. Hirschberg, Rikshospitalet (Norway) . . . [6141-52]

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

6141 continues on page 29

Conference 6145

ROOM: Town & Country

Tuesday-Thursday 14-16 Feb. 2006
Proceedings of SPIE Vol. 6145

PACS and Imaging Informatics

Conference Chairs: **Steven C. Horii**, Univ. of Pennsylvania; **Osman M. Ratib**, Univ. Hospital of Geneva (Switzerland)

Program Committee: **Katherine P. Andriole**, Harvard Medical School; **William M. Angus**, Philips Medical Systems; **Janice C. Honeyman-Buck**, Univ. of Florida; **Heinz U. Lemke**, Technische Univ. Berlin (Germany); **Brent J. Liu**, Univ. of Southern California; **Greg T. Mogel**, Univ. of Southern California

Posters for this conference will be on display Tuesday and Wednesday, 14-15 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Wednesday evening from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

SESSION 1

RM: Town & Country Tues. 1:20 to 3:00 pm

Display and Interpretation I

Chair: **Steven C. Horii**, Univ. of Pennsylvania

Keynote

1:20 pm: **The iSite concept: a convergence of medicine, engineering, and science,** P. J. Chang, Univ. of Pittsburgh Medical Ctr. . . . . [6145-01]

2:00 pm: **MoniQA: a general approach to monitor quality assurance,** T. J. Deprez, J. Jacobs, G. Marchal, H. Bosmans, Univ. Ziekenhuizen Leuven (Belgium) . . . . . [6145-02]

2:20 pm: **A method for reduction of eye fatigue by optimizing the ambient light conditions in medical imaging reading rooms,** A. S. Chawla, E. Samei, Duke Univ. . . . . [6145-03]

2:40 pm: **Interpretation time required for chest direct radiography with and without dual-energy subtraction,** K. M. Siddiqui, VA Maryland Health Care System; P. A. Vandermeer, Univ. of Maryland Medical System; W. W. Boonn, Univ. of Pennsylvania; A. E. Musk, N. M. Safdar, Univ. of Maryland Medical System; R. Moffitt, VA Maryland Health Care System; T. R. Fleiter, C. S. White, R. D. Pugatch, Univ. of Maryland Medical System; B. I. Reiner, E. Siegel, VA Maryland Health Care System . . . . . [6145-04]

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

6145 continues on page 29

Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 10

Room: California . Tues. 1:20 to 3:00 pm

Optical Imaging

Chair: **Andreas H. Hielscher**, Columbia Univ.

1:20 pm: **Imaging system for creating 3D block face images of whole mice,** D. Roy, M. S. Breen, O. Salvado, M. E. Heinzel, E. T. McKinley, D. L. Wilson, Case Western Reserve Univ. . . . . [6143-50]

1:40 pm: **Evaluating dynamic contrast-enhanced and photoacoustic CT to assess intra-tumor heterogeneity in wild-type and VEGF enhanced MCF-7 breast tumors,** K. M. Stantz, Purdue Univ.; Y. Liang, Indiana Univ.; B. Liu, M. Cao, Purdue Univ.; D. R. Reinecke, Optosonics, Inc.; K. D. Miller, Indiana Univ.; R. Kruger, Optosonics, Inc. . . . . [6143-51]

2:00 pm: **Understanding the origins of near-infrared optical contrast by combining diffuse optical spectroscopy with contrast-enhanced MRI,** A. E. Cerussi, S. I. Merritt, N. S. Shah, S. Chung, D. Hsiang, B. J. Tromberg, Univ. of California/Irvine . . . . . [6143-52]

2:20 pm: **3D in-vivo imaging of GFP-expressing T-cells in mice with non-contact fluorescence molecular tomography,** A. Garofalakis, H. Meyer, G. Zacharakis, E. N. Economou, K. Mamalaki, J. Papamatheakis, Foundation for Research and Technology-Hellas (Greece); V. Ntziachristos, Massachusetts General Hospital; J. Ripoll, Foundation for Research and Technology-Hellas (Greece) . . . . . [6143-53]

2:40 pm: **Image quantification of high-throughput tissue microarray,** J. Wu, Wellcome Trust Sanger Institute (United Kingdom); J. Dong, Ocean Univ. of China (China); H. Zhou, Univ. of Essex (United Kingdom) . . . [6143-54]

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

6143 continues on page 29

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 6

Room: Golden West Tues. 1:20 to 3:00 pm

Registration I

Chair: **David R. Haynor**, Univ. of Washington

1:20 pm: **Large-scale validation of non-rigid registration algorithms for atlas-based brain,** W. Qian, E. D'Agostino, D. Seghers, F. Maes, D. Vandermeulen, P. Suetens, Katholieke Univ. Leuven (Belgium) . . . . . [6144-28]

1:40 pm: **Multimodal inter-subject registration of mouse brain images,** X. Li, T. Yankeelov, Vanderbilt Univ.; G. Rosen, Harvard Univ.; J. Gore, B. M. Dawant, Vanderbilt Univ. . . . . [6144-29]

2:00 pm: **Improved method for correction of systematic bias introduced by the sub-voxel image registration process in functional magnetic resonance imaging (fMRI),** D. H. Wu, Univ. of Oklahoma Health Sciences Ctr.; J. S. Suri, Biomedical Technologies Inc.; V. A. Magnotta, The Univ. of Iowa; T. Przebinda, V. DeBrunner, Univ. of Oklahoma . . . . . [6144-30]

2:20 pm: **Quantification of the migration and deformation of abdominal aortic aneurysm stent grafts,** J. J. Mattes, Univ. für Gesundheitswissenschaften, Medizinische Informatik und Technik (Austria); I. Steingruber, Innsbruck Medical Univ. (Austria); M. Netzer, K. D. Fritscher, Univ. für Gesundheitswissenschaften, Medizinische Informatik und Technik (Austria); H. Kopf, W. Jaschke, Innsbruck Medical Univ. (Austria); R. Schubert, Univ. für Gesundheitswissenschaften, Medizinische Informatik und Technik (Austria) . . . . . [6144-31]

2:40 pm: **(ST) Dual-resolution deformable registration for matching abdominal CT images,** J. B. West, C. R. Maurer, Jr., J. R. Dooley, Accuray Inc.; G. K. Rohde, Univ. of Maryland/ College Park . . . . . [6144-32]

2:50 pm: **(ST) Multimodal 2D-3D non-rigid registration,** M. Pruemmer, J. Hornegger, A. Doerfler, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [6144-33]

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

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Conference 6141 *continued*

Visualization, Image-Guided Procedures, and Display

ROOM: San Diego

SESSION 11

Room: San Diego . Tues. 3:30 to 5:30 pm

Radiation Oncology and Other

Chair: **David R. Haynor**, Univ. of Washington

3:30 pm: **Incorporating seed orientation in brachytherapy implant reconstruction,** Y. Zhou, A. K. Jain, G. S. Chirikjian, G. Fichtinger, Johns Hopkins Univ. . . . . [6141-53]

3:50 pm: **A perspective matrix-based seed reconstruction algorithm with applications to C-arm based intra-operative dosimetry,** S. Narayanan, P. S. Cho, Univ. of Washington . . . . . [6141-54]

4:10 pm: **Rapid prototype modeling in a multimodality world,** L. M. Bidaut, J. Madewell, A. Yasko, The Univ. of Texas M.D. Anderson Cancer Ctr. . . . . [6141-55]

4:30 pm: **3D ultrasound-based patient positioning for radiotherapy,** M. H. Wang, R. N. Rohling, The Univ. of British Columbia (Canada); N. Archip, Harvard Medical School; B. Clark, British Columbia Cancer Agency (Canada) . . . . . [6141-56]

4:50 pm: **CT fluoroscopy-guided robotically assisted lung biopsy,** S. Xu, G. Fichtinger, R. H. Taylor, Johns Hopkins Univ.; F. Banovac, K. R. Cleary, Georgetown Univ. . . [6141-57]

5:10 pm: **Stochastic modeling, virtual refinement and deterministic fabrication of tissue engineering scaffolds,** S. Rajagopalan, R. A. Robb, Mayo Clinic . . . . . [6141-58]

6141 Ends ■

Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: Town & Country

SESSION 2

RM: Town & Country Tues. 3:30 to 4:50 pm

Display and Interpretation II

Chair: **Katherine P. Andriole**, Harvard Medical School

3:30 pm: **Network-based reading system for lung cancer screening CT,** Y. Fujino, K. Fujimura, Nippon Telegraph and Telephone Corp. (Japan); S. Nomura, Nippon Telegraph and Telephone West Corp. (Lao PDR); H. Kawashima, Nippon Telegraph and Telephone Corp. (Japan); M. Tsuchikawa, Advanced Telecommunications Research Institute International (Japan); T. Matsumoto, National Institute of Radiological Sciences (Japan); K. Nagao, T. Uruma, Chiba Univ. (Japan); S. Yamamoto, H. Takizawa, Toyohashi Univ. of Techonology (Japan) . . . . . [6145-05]

3:50 pm: **CMAS: a rich media annotation system for medical imaging,** I. Lin, H. Chao, Hewlett Packard Co. . . . . [6145-06]

4:10 pm: **Defining and evaluating custom 2D, 3D, and advanced imaging digital display protocols,** W. W. Boonn, Univ. of Pennsylvania; K. M. Siddiqui, Veterans Affairs Medical Ctr.; P. Vandermeer, Univ. of Maryland Medical System; J. Whipple, S. Severance, Veterans Affairs Medical Ctr.; N. Safdar, Univ. of Maryland Medical System; B. I. Reiner, E. L. Siegel, Veterans Affairs Medical Ctr. . . . . [6145-07]

4:30 pm: **On-demand rendering of an oblique slice through 3D volumetric data using JPEG2000 client-server framework,** R. L. Joshi, Eastman Kodak Co. . . . . [6145-08]

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Conference 6143 *continued*

Physiology, Function, and Structure from Medical Images

ROOM: California

SESSION 11

Room: California . Tues. 3:30 to 5:30 pm

Special Session on Optical Tomographic Imaging

Chair: **Andreas H. Hielscher**, Columbia Univ.

3:30 pm: **Time domain optical molecular imaging of small animals in vivo** *(Invited Paper),* D. J. Hall, Univ. of California/San Diego . . . . . [6143-55]

4:00 pm: **Near infrared spectroscopy and tomography for tumor prognosis and treatment monitoring** *(Invited Paper),* H. Liu, J. G. Kim, B. Wang, The Univ. of Texas at Arlington; R. P. Mason, The Univ. of Texas Southwestern Medical Ctr. at Dallas . . . [6143-56]

4:30 pm: **Functional imaging of small tissue volumes with diffuse optical tomography** *(Invited Paper),* A. D. Klose, A. H. Hielscher, Columbia Univ. . . . . [6143-57]

5:00 pm: **Laminar optical tomography: high-resolution 3D functional imaging of superficial tissues** *(Invited Paper),* E. M. Hillman, A. K. Dunn, Massachusetts General Hospital; A. M. Dale, Univ. of California/San Diego; D. A. Boas, Massachusetts General Hospital . . . . . [6143-58]

6143 Ends ■

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 7

Room: Golden West Tues. 3:30 to 5:30 pm

Registration II

Chair: **Christian Barillot**, IRISA (France)

3:30 pm: **Explicit rigid and similarity image registration,** O. Skrinjar, M. Khan, Georgia Institute of Technology . . . . . [6144-34]

3:50 pm: **On the alignment of shapes represented by Fourier descriptors,** K. V. Skoglund, Danmarks Tekniske Univ. (Denmark); A. Ericsson, Lund Institute of Technology (Sweden); R. D. Larsen, Danmarks Tekniske Univ. (Denmark) . . . . . [6144-35]

4:10 pm: **Mjolnir: deformable image registration using feature diffusion,** L. M. Ellingsen, J. L. Prince, Johns Hopkins Univ. . . . . [6144-36]

4:30 pm: **Non-rigid brain image registration using a statistical deformation model,** J. Wouters, Katholieke Univ. Leuven (Belgium); E. D'Agostino, Univ. Ziekenhuizen Leuven (Belgium); F. Maes, D. Vandermeulen, P. Suetens, Katholieke Univ. Leuven (Belgium) . . . . . [6144-37]

4:50 pm: **Nonrigid registration using regularization that accomodates local tissue rigidity,** D. Ruan, J. A. Fessler, M. E. Roberson, M. L. Kessler, J. M. Balter, Univ. of Michigan . . . . . [6144-38]

5:10 pm: **Nonrigid registration using a rigidity constraint,** M. Staring, S. Klein, J. P. Pluim, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . [6144-39]

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Conference 6146

ROOM: San Diego

Wed.-Thurs. 15-16 Feb. 2006
Proceedings of SPIE Vol. 6146

Image Perception, Observer Performance, and Technology Assessment

Conference Chairs: **Yulei Jiang**, The Univ. of Chicago; **Miguel P. Eckstein**, Univ. of California/Santa Barbara

Program Committee: **David J. Manning**, St. Martin's College (United Kingdom); **Berkman Sahiner**, Univ. of Michigan

Posters for this conference will be on display Tuesday and Wednesday, 14-15 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Wednesday evening from 5:30 to 7:00 pm. All poster awards will be presented at 6:30 pm during the reception.

WORKSHOP

RM: San Diego . . Tues. 5:45 to 7:45 pm

How Experts Interpret Images: An Interactive Panel of Radiologists

Panelists: **Harold L. Kundel**, Univ. of Pennsylvania; **Eliot L. Siegel**, Veterans Affairs Medical Ctr.; **Ronald M. Summers**, National Institutes of Health; **Steven C. Horii**, Univ. of Pennsylvania

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Conference 6142 *continued*

Physics of Medical Imaging
ROOM: Town & Country

WORKSHOP

RM: Town & Country Tues. 5:45 to 7:45 pm

Measures of Physical Performance for X-ray imaging Systems

Chair: **Ehsan Samei**, Duke Univ.

6142 continues on page 31

Conference 6145 *continued*

PACS and Imaging Informatics
ROOM: California

WORKSHOP

RM: California . . . Tues. 5:45 to 7:45 pm

DICOM

Moderator: **Robert J. Horn III**, Agfa Corp.

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Conference 6144 *continued*

Image Processing
ROOM: Golden West

WORKSHOP

RM: GoldenWest . Tues. 5:45 to 7:45 pm

Evaluation of Image Segmentation

Speakers: **Jayaram K. Udupa**, Univ. of Pennsylvania; **Guido Gerig**, The Univ. of North Carolina System; **Simon K. Warfield**, Brigham and Women's Hospital

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Conference 6146 *continued*

Image Perception, Observer Performance, and Technology Assessment

ROOM: San Diego

SESSION 1

RM: San Diego . . . . Wed. 8:00 to 9:40 am

Technology Assessment and Impact

Chair: **Darrin C. Edwards**, The Univ. of Chicago

8:00 am: **Can radiologists recognize that a computer has identified cancers that they have overlooked?,** R. M. Nishikawa, A. V. Edwards, R. A. Schmidt, J. Papaioannou, The Univ. of Chicago; M. N. Linver, X-Ray Associates of New Mexico . [6146-01]

8:20 am: **Actual versus intended use of CAD systems in the clinical environment,** D. Gur, D. Chough, C. Cohen, J. H. Sumkin, G. Abrams, M. A. Ganott, L. Wallace, R. Shah, B. Zheng, Univ. of Pittsburgh [6146-02]

8:40 am: **Mass detection in mammographic ROIs using Watson filters,** S. Singh, Duke Univ.; A. H. Baydush, Wake Forest Univ.; B. P. Harrawood, J. Y. Lo, Duke Univ. . . . . [6146-47]

9:00 am: **A method for assessing the uncertainty in feature selection tasks,** Y. Jiang, The Univ. of Chicago . . . . . [6146-04]

9:20 am: **Comparative performance analysis for computer-aided lung nodule detection and segmentation on ultra-low-dose vs. standard dose CT,** R. Wiemker, Philips Research Labs. (Germany); P. Rogalla, Humboldt Univ. (Germany); R. Opfer, Philips Research Labs. (Germany); A. Ekin, Philips Research Labs. (Netherlands); T. Bülow, Philips Research Labs. (Germany); E. Hein, V. Romano, Humboldt Univ. (Germany) . [6146-05]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 10

RM: Town & Country Wed. 8:00 to 9:40 am

Dual Energy X-ray Imaging

Chair: **Michael J. Flynn**, Henry Ford Health System

8:00 am: **High-performance dual-energy imaging with a flat-panel detector: imaging physics from blackboard to benchtop to bedside,** J. H. Siewerdsen, N. A. Shkumat, A. C. Dhanantwari, D. B. Williams, S. Richard, M. J. Daly, Univ. of Toronto/ Ontario Cancer Institute (Canada); N. S. Paul, Univ. Health Network (Canada); D. J. Moseley, Univ. Health Network/Ontario Cancer Institute (Canada); D. A. Jaffray, Univ. of Toronto/Ontario Cancer Institute (Canada); J. Yorkston, R. Van Metter, Eastman Kodak Co. . . . . [6142-50]

8:20 am: **The impact of cardiac gating on the detection of coronary calcifications in dual-energy chest radiography: a phantom study,** J. M. Sabol, R. Liu, R. Saunders, J. Markley, N. Moreno, J. Seamans, S. Wiese, K. N. Jabri, GE Healthcare; R. C. Gilkeson, Univ. Hospitals of Cleveland . . . . . [6142-51]

8:40 am: **Accuracy and precision of dual energy CT imaging for the quantification of tissue fat content,** D. J. Walter, J. E. Tkaczyk, X. Wu, GE Global Research . . . . . [6142-52]

9:00 am: **Dual-energy imaging using a photon counting detector with electronical spectrum-splitting,** H. Bornefalk, Kungliga Tekniska Högskolan (Sweden); M. Lundqvist, Sectra Mamea AB (Sweden) [6142-53]

9:20 am: **Multispectral single-scan lung imaging system: part I-initial feasibility,** G. M. Besson, K. E. Crocker, ForeVision Technologies Corp. . . . . [6142-54]

Coffee Break . . . . . 9:40 to 10:10 am

6142 continues on page 32

Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: California

SESSION 3

RM: California . . . . Wed. 8:00 to 9:40 am

PACS in Surgery

Chair: **Heinz Lemke**, Technische Univ. Berlin (Germany)

8:00 am: **PACS in surgery: developments towards a surgical DICOM** *(Invited Paper),* H. Lemke, Technische Univ. Berlin (Germany) . . . . . [6145-09]

8:40 am: **Structured recording of intraoperative surgical workflows,** T. Neumuth, N. Durstewitz, M. Fischer, G. Strauss, A. Dietz, Univ. Leipzig (Germany); P. Jannin, Univ. de Rennes I (France); K. R. Cleary, Georgetown Univ.; H. Lemke, O. Burgert, Univ. Leipzig (Germany) . . . . . [6145-10]

9:00 am: **Workflow in interventional radiology: nerve blocks and facet blocks,** D. R. Siddoway, K. R. Cleary, Georgetown Univ.; O. Burgert, T. Neumuth, Univ. Leipzig (Germany); V. Watson, Georgetown Univ. [6145-11]

9:20 am: **An ultrasound image-guided surgical workflow model,** B. Guo, Univ. of Southern California; H. Lemke, Technische Univ. Berlin (Germany); B. J. Liu, H. K. Huang, E. G. Grant, Univ. of Southern California . . . . . [6145-12]]

Coffee Break . . . . . 9:40 to 10:10 am

6145 continues on page 32

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 8

RM: Golden West . . Wed. 8:00 to 9:40 am

Registration III

Chair: **Benoit M. Dawant**, Vanderbilt Univ.

8:00 am: **Reconstruction of 4D-CT data sets acquired for modeling and analysis of breathing motion,** J. Ehrhardt, R. Werner, T. Frenzel, D. Saering, Univ. Medical Ctr. Hamburg-Eppendorf (Germany); L. Wei, D. A. Low, Mallinckrodt Institute of Radiology; H. Handels, Univ. Medical Ctr. Hamburg-Eppendorf (Germany) . . . . . [6144-40]

8:20 am: **Globally optimal model-based matching of anatomical trees,** M. W. Graham, W. E. Higgins, The Pennsylvania State Univ. . . [6144-41]

8:40 am: **A comparison of FFD-based nonrigid registration and AAMS applied to myocardial perfusion MRI,** H. Ólafsdóttir, M. B. Stegmann, B. K. Ersbøll, Danmarks Tekniske Univ. (Denmark); H. B. Larsson, Copenhagen Univ. Hospital Glostrup (Denmark) . . . . . [6144-42]

9:00 am: **Cardiac motion estimation by using high-dimensional features and k-means clustering method,** E. Oubel, Univ. Pompeu Fabra (Spain); A. Hero, Univ. of Michigan; A. F. Frangi, Univ. Pompeu Fabra (Spain) [6144-43]

9:20 am: **(ST) Registration of 2D cardiac images to real-time 3D ultrasound volumes for 3D stress echocardiography,** E. Leung, Univ. Medisch Ctr. Rotterdam (Netherlands); M. v. Stralen, Univ. Medisch Ctr. Rotterdam (Netherlands) and The Interuniv. Cardiology Institute of the Netherlands (Netherlands) and Univ. Leiden (Netherlands); M. Voormolen, Univ. Medisch Ctr. Rotterdam (Netherlands) and The Interuniv. Cardiology Institute of the Netherlands; G. v. Burken, A. Nemes, F. T. Cate, Univ. Medisch Ctr. Rotterdam (Netherlands); N. d. Jong, Univ. Medisch Ctr. Rotterdam (Netherlands) and The Interuniv. Cardiology Institute of the Netherlands (Netherlands); J. Bosch, Univ. Medisch Ctr. Rotterdam (Netherlands) . . . . . [6144-44]

9:30 am: **(ST) Real time registration by tracking for MR guided cardiac interventions,** D. Chung, G. Wright, P. E. Radau, Sunnybrook and Women's Health Sciences Ctr. (Canada) . . . . . [6144-45]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6146 *continued*

Image Perception, Observer Performance, and Technology Assessment

ROOM: San Diego

SESSION 2

RM: San Diego Wed. 10:10 am to 12:10 pm

Keynote and Image Display

Chair: **Yulei Jiang**, The Univ. of Chicago

Keynote

10:10 am: **Recent developments and outstanding problems for the field of diagnostic technology assessment,** R. F. Wagner, U.S. Food and Drug Administration . . . . . [6146-06]

11:10 am: **Potential use of a large-screen display for interpreting radiographic images,** E. A. Krupinski, W. Berger, H. Roehrig, The Univ. of Arizona; S. Dalal, D. Stanton, Philips Electronics North America . [6146-07]

11:30 am: **Impact of defective pixels in AMLCDs on the perception of medical images,** T. R. L. Kimpe, Y. Sneyders, Barco N.V. (Belgium) . . . . . [6146-08]

11:50 am: **Assessment of the influence of display veiling glare on observer and model performance,** E. A. Krupinski, The Univ. of Arizona; J. Lubin, Sarnoff Corp.; H. Roehrig, The Univ. of Arizona; J. P. Johnson, J. Nafziger, Siemens Corporate Research . . . . . [6146-09]

Lunch/Exhibition Break 12:10 to 1:20 pm

6146 continues on page 33

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 11

RM: Town & Country . . . . . Wed. 10:10 am to 12:10 pm

Computational Simulation

Chair: **Aldo Badano**, U.S. Food and Drug Administration

10:10 am: **Simulated and experimental technique optimization of dual-energy radiography: abdominal imaging applications,** J. M. Sabol, S. J. Wheeldon, K. N. Jabri, GE Healthcare . [6142-55]

10:30 am: **Light transport in trabecular bone: Monte Carlo simulation based on 3D triangle meshes,** E. Margallo-Balbás, P. J. French, P. A. Wieringa, Technische Univ. Delft (Netherlands) . . . [6142-56]

10:50 am: **Optimal spectra for indirect detector breast tomosynthesis,** S. J. Glick, X. Gong, Univ. of Massachusetts Medical School . . . . . [6142-57]

11:10 am: **Development of a computer-generated model for the coronary arterial tree based on multislice CT and morphometric data,** G. S. K. Fung, The Univ. of Hong Kong (Hong Kong China) and Johns Hopkins Univ.; W. P. Segars, K. Taguchi, E. K. Fishman, Johns Hopkins Univ.; B. M. Tsui, Johns Hopkins Univ . . . . . [6142-58]

11:30 am: **Monte Carlo simulation of x-ray scatter based on patient model from digital breast tomosynthesis,** B. Liu, T. Wu, Massachusetts General Hospital . . . . . [6142-59]

11:50 am: **Breast cancer diagnosis using neutron simulated emission computed tomography: dose and count requirements,** C. E. Floyd, Jr., J. E. Bender, A. J. Kapadia, A. C. Sharma, B. P. Harrawood, G. D. Tourassi, J. Y. Lo, C. Howell, Duke Univ. . . . . [6142-60]

Lunch/Exhibition Break 12:10 to 1:20 pm

6142 continues on page 33

Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: California

SESSION 4

RM: California . . Wed. 10:10 to 11:50 am

PACS Technology and Architecture

Chair: **Brent J. Liu**, Univ. of Southern California

10:10 am: **Medical compliance,** P. Kevill, Applied Micro Circuits Corp. . . . . [6145-13]

10:30 am: **Peer-to-peer architecture for multidepartmental distributed PACS,** A. Rosset, O. M. Ratib, J. Heuberger, Univ. Hospital of Geneva (Switzerland) . . . . . [6145-14]

10:50 am: **A demanding Web-based PACS supported by web services technology,** C. M. Costa, J. L. Oliveira, A. M. Silva, Univ. de Aveiro (Portugal); V. G. Ribeiro, J. Ribeiro, Ctr. Hospitalar de Vila Nova de Gaia (Portugal) . . . . . [6145-16]

11:10 am: **A design methodology for fault-tolerance in a DICOM-compliant data storage grid,** J. R. Documet, Z. Zhou, B. J. Liu, N. King, H. K. Huang, Univ. of Southern California . . . . . [6145-17]

11:30 am: **Medical image compression using cubic spline interpolation for low bit-rate telemedicine applications,** S. Chen, Shu-Te Univ. (Taiwan); T. Truong, I-Shou Univ. (Taiwan) . . . . . [6145-18]

Lunch/Exhibition Break . . . . . 11:50 am to 1:20 pm

6145 continues on page 33

Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 9

RM: Golden West Wed. 10:10 am to 12:10 pm

Restoration and Filtering

Chair: **Sunanda D. Mitra**, Texas Tech Univ.

10:10 am: **A homomorphic filtering framework for DT-MRI,** C. A. Castaño Moraga, Univ. de Las Palmas de Gran Canaria (Spain); C. Westin, Harvard Medical School; J. Ruiz-Alzola, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [6144-46]

10:30 am: **Theoretical framework for analyzing MR imaging of dynamic objects using filters and downsamplers,** H. K. Agarwal, J. L. Prince, Johns Hopkins Univ. . . . . [6144-47]

10:50 am: **A novel strategy for segmentation of magnetic resonance (MR) images corrupted by intensity inhomogeneity artifacts,** W. Chen, M. L. Giger, The Univ. of Chicago . . . . . [6144-48]

11:10 am: **Apparent diffusion coefficient estimation from high-angular resolution diffusion images,** M. Descoteaux, R. Deriche, Institut National de Recherche en Informatique et en Automatique (France) . [6144-49]

11:30 am: **Restoration of 3D medical images with total variation scheme on wavelet domains (TVW),** A. Ogier, P. Hellier, C. Barillot, IRISA (France) . . . . . [6144-50]

11:50 am: **A pixelwise inpainting-based refinement scheme for quantizing calcification in the lumbar aorta on 2D lateral x-ray images,** L. A. Conrad-Hansen, M. de Bruijne, F. Lauze, IT-Univ. i Kobenhavn (Denmark); L. Tanko, Ctr. for Clinical and Basic Research (Denmark); M. Nielsen, IT-Univ. i Kobenhavn (Denmark) . . . . . [6144-51]

Lunch/Exhibition Break 12:10 to 1:20 pm

6144 continues on page 33

Conference 6146 *continued*

Image Perception, Observer Performance, and Technology Assessment

ROOM: San Diego

SESSION 3

RM: San Diego . . . . Wed. 1:20 to 3:00 pm

ROC Methods

Chair: **Berkman Sahiner**, Univ. of Michigan

1:20 pm: **Optimization of an ROC hypersurface constructed only from an observer's within-class sensitivities,** D. C. Edwards, C. E. Metz, The Univ. of Chicago . . . . . [6146-10]

1:40 pm: **Optimal observer framework and categorization observer framework for three-class ROC analysis,** X. He, E. C. Frey, Johns Hopkins Univ. . . . . [6146-11]

2:00 pm: **Performance analysis of 3-class classifiers: properties of the 3D ROC surface and the normalized volume under the surface,** B. Sahiner, H. Chan, L. M. Hadjiiski, Univ. of Michigan . . . . . [6146-12]

2:20 pm: **Exploring FROC paradigm: initial experience with clinical applications,** L. Volokh, GE Healthcare Technologies and Johns Hopkins School of Medicine; C. Liu, B. M. W. Tsui, Johns Hopkins Univ. . . [6146-13]

2:40 pm: **LROC assessment of nonlinear filtering methods in Ga-67 SPECT imaging,** S. De Clercq, S. G. Staelens, J. De Beenhouwer, Y. D'Asseler, I. L. Lemahieu, Univ. Gent (Belgium) . . . . . [6146-14]

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

6146 continues on page 34

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 12

RM: Town & Country Wed. 1:20 to 3:00 pm

X-ray Imaging Detectors II

Chair: **Wei Zhao**, Stony Brook Univ.

1:20 pm: **Theoretical investigation of very high quantum efficiency, segmented, crystalline detectors for low-contrast visualization in megavoltage cone-beam CT,** Y. Wang, L. E. Antonuk, A. R. Sawant, Y. El-Mohri, Q. Zhao, H. Du, Y. Li, Univ. of Michigan . . . . . [6142-61]

1:40 pm: **CMOS cassette for digital upgrade of film-based mammography systems,** M. A. Baysal, E. Toker, Bioptics, Inc. . . . . [6142-62]

2:00 pm: **New light-amplifier-based detector designs for high spatial resolution and high sensitivity CBCT mammography,** S. Rudin, G. Yadava, G. Josan, A. Kuhls, H. Rangwala, Y. M. Wu, C. Ionita, D. Bednarek, SUNY/Univ. at Buffalo . . . . [6142-63]

2:20 pm: **Effect of ghosting on the modulation transfer function of a-Se based flat panel imagers,** O. Tousignant, Anrad Corp. (Canada); L. Chowdhury, W. Zhao, D. C. Hunt, G. DeCrescenzo, J. A. Rowlands, Sunnybrook and Women's Health Sciences Ctr. (Canada) . . . . [6142-64]

2:40 pm: **Single-photon spatial resolution enhancement of columnar CsI(Tl) using centroid estimation and event discrimination,** B. W. Miller, College of Optical Sciences/The Univ. of Arizona; H. B. Barber, H. H. Barrett, The Univ. of Arizona; I. Shestakova, B. K. Singh, V. V. Nagarkar, Radiation Monitoring Devices, Inc. . . . [6142-65]

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

6142 continues on page 34

Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: California

SESSION 5

RM: California . . . . Wed. 1:20 to 3:00 pm

Databases and Data Mining

Chair: **Janice C. Honeyman-Buck**, Univ. of Florida

1:20 pm: **The retrieval process in the SAFRS (Système d'Aide à la Formation des Radiologues-Sénologues) system with the case-based reasoning approach,** S. Demigha, Univ. Paris 1 Panthéon Sorbonne (France) . . . . . [6145-19]

1:40 pm: **Atlas of protein expression: image capture, analysis and design of terabyte image database,** J. Wu, G. Maslen, A. Warford, J. Xie, G. Griffin, S. Crowther, J. McCafferty, Wellcome Trust Sanger Institute (United Kingdom) . . . . . [6145-20]

2:00 pm: **Relevance feedback for shape-based pathology in spine x-ray image retrieval,** X. Xu, Brigham Young Univ.; S. K. Antani, National Library of Medicine; D. Lee, Brigham Young Univ.; L. R. Long, G. R. Thoma, National Library of Medicine [6145-21]

2:20 pm: **BIRAM: a content-based image retrieval framework for medical images,** R. A. Moreno, S. S. Furuie, Instituto do Coracão do Hospital das Clínicas (Brazil) [6145-22]

2:40 pm: **Automated dual-energy x-ray absorptiometry (DEXA) bone densitometry reporting solution for Hologic(r) scanners,** W. Kim, W. W. Boonn, Univ. of Pennsylvania . . . . . [6145-54]

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

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Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 10

RM: Golden West . . Wed. 1:20 to 3:00 pm

Shape

Chair: **Alejandro F. Frangi**, Univ. Pompeu Fabra (Spain)

1:20 pm: **Sparse modeling of landmark and texture variability using the orthomax criterion,** M. B. Stegmann, K. V. Skoglund, Danmarks Tekniske Univ. (Denmark) . . [6144-52]

1:40 pm: **A representation and classification scheme for tree-like structures in medical images: an application on branching pattern analysis of ductal trees in x-ray galactograms,** V. Megalooikonomou, D. Kontos, J. Danglemaier, A. Javadi, Temple Univ.; P. R. Bakic, A. D. A. Maidment, Univ. of Pennsylvania . . . . . [6144-53]

2:00 pm: **Three-dimensional analysis of alveolar bone resorption by image processing of 3D dental CT images,** J. Nagao, T. Kitasaka, K. Mori, Y. Suenaga, Nagoya Univ. (Japan); S. Yamada, M. Naitoh, Aichi Gakuin Univ. (Japan) . . . . . [6144-54]

2:20 pm: **Optimal landmark distributions for statistical shape model construction,** T. Heimann, I. Wolf, H. Meinzer, Deutsches Krebsforschungszentrum (Germany) [6144-55]

2:40 pm: **(ST) An iso-surface folding analysis method applied to premature neonatal brain development,** C. E. Rodriguez-Carranza, Univ. of California/San Francisco and VA Medical Ctr./San Francisco; F. Rousseau, Univ. of California/San Francisco; B. Iordanova, VA Medical Ctr./San Francisco; O. Glenn, D. B. Vigneron, J. A. Barkovich, Univ. of California/San Francisco; C. Studholme, Univ. of California/San Francisco and VA Medical Ctr./San Francisco . [6144-56]

2:50 pm: **(ST) Image-based metrology of porous tissue engineering scaffolds,** S. Rajagopalan, R. A. Robb, Mayo Clinic . . . . . [6144-57]

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

6144 continues on page 34

Conference 6146 *continued*

Image Perception, Observer Performance, and Technology Assessment

ROOM: San Diego

SESSION 4

Room: San Diego . . Wed. 3:30 to 5:30 pm

Observer Performance Evaluation

Chair: **David J. Manning**, St. Martin's College (United Kingdom)

3:30 pm: **Incorporating detection tasks into the quantitative assessment of image quality,** E. M. Scalzetti, W. Huda, K. M. Ogden, M. Khan, M. L. Roskopf, D. Ogden, Upstate Medical Univ./SUNY [6146-15]

3:50 pm: **Tanner and Birdsall revisited: d' and efficiency,** A. E. Burgess, Brigham and Women's Hospital . . . . . [6146-16]

4:10 pm: **Effect of dose reduction on the detection of mammographic lesions based on mathematical observer models,** A. S. Chawla, R. S. Saunders, Jr., E. Samei, Duke Univ. . . . . [6146-17]

4:30 pm: **Observer experiments: design and methods,** A. E. Burgess, Brigham and Women's Hospital . . . . . [6146-18]

4:50 pm: **Evaluation of MR parallel reconstructions: detection and perceptual difference studies,** Y. Jiang, D. L. Wilson, Case Western Reserve Univ. . . . . [6146-19]

5:10 pm: **Using perceptual difference model to improve GRAPPA reconstruction in MRI,** D. Huo, D. L. Wilson, Case Western Reserve Univ. . . . . [6146-20]

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Conference 6142 *continued*

Physics of Medical Imaging

ROOM: Town & Country

SESSION 13

RM: Town & Country Wed. 3:30 to 5:30 pm

CT and DR Performance Assessment

Chair: **Ehsan Samei**, Duke Univ.

3:30 pm: **A practical method for measuring the H matrix of digital x-ray and cone beam CT imaging systems,** I. S. Kyprianou, A. G. Badano, S. Park, B. D. Gallas, L. Thompson, K. J. Myers, U.S. Food and Drug Administration . . . [6142-66]

3:50 pm: **Experimental spectral measurements of heavy K-edge filtered beams for x-ray computed mammotomography,** D. J. Crotty, R. L. McKinley, M. P. Tornai, Duke Univ. . . . . [6142-67]

4:10 pm: **Preliminary validation of a new methodology for estimating dose reduction protocols in neonatal chest computed radiographs,** S. Don, B. R. Whiting, C. F. Hildebolt, Washington Univ. in St. Louis; J. Sehnert, J. S. Ellinwood, K. Topfer, Eastman Kodak Co. . . . . [6142-68]

4:30 pm: **A method to measure the temporal MTF to determine the DQE of fluoroscopy systems,** S. N. Friedman, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); I. A. Cunningham, Robarts Research Institute (Canada) and London Health Sciences Ctr. (Canada) and The Univ. of Western Ontario (Canada) [6142-69]

4:50 pm: **A novel method to characterize the MTF in 3D for computed mammotomography,** P. Madhav, Duke Univ. Medical Ctr. and Duke Univ.; R. L. McKinley, E. Samei, Duke Univ. and Duke Univ. Medical Ctr.; J. E. Bowsher, Duke Univ. Medical Ctr.; M. P. Tornai, Duke Univ. Medical Ctr. and Duke Univ. . . . . [6142-70]

5:10 pm: **Measurement of the spatial resolution of a clinical volumetric computed tomography scanner using a sphere phantom,** M. M. Thornton, Robarts Research Institute (Canada); M. J. Flynn, Henry Ford Health System . . . . . [6142-71]

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Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: California

SESSION 6

RM: California . . . . Wed. 3:30 to 5:30 pm

Imaging Informatics and Standards

Chair: **Osman M. Ratib**, Univ. Hospital of Geneva (Switzerland)

3:30 pm: **An ontology supporting daily practice requirements of radiologists-senologists with the standard BI-RADS,** S. Demigha, C. Rolland, Univ. Paris 1 Panthéon Sorbonne (France) . . . . . [6145-24]

3:50 pm: **Building an IT Healthcare Enterprise by taking the standards to the limits and sometimes beyond that,** M. Wintell, S. Gustavsson, Sahlgrenska Univ. Hospital (Sweden); L. Lindsköld, Borås Hospital (Sweden) . . . . . [6145-25]

4:10 pm: **A unified approach for the adequate visualization of structured medical reports,** J. Riesmeier, M. Eichelberg, T. Wilkens, Kuratorium OFFIS e.V. (Germany); P. Jensch, Carl von Ossietzky Univ. Oldenburg (Germany) . . . . . [6145-26]

4:30 pm: **IHE cross-enterprise document sharing for imaging: design challenges,** R. Noumeir, École de Technologie Supérieure (Canada) . . . . . [6145-27]

4:50 pm: **Three-dimensional lossless digital signature embedding for the integrity of volumetric images,** Z. Zhou, H. K. Huang, B. J. Liu, Univ. of Southern California . . . . . [6145-28]

5:10 pm: **A DICOM-RT ePR radiation therapy information system for managing brain tumor patients,** B. J. Liu, M. Y. Law, H. K. Huang, C. Zee, L. W. Chan, Univ. of Southern California . . . . . [6145-29]

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Conference 6144 *continued*

Image Processing

ROOM: Golden West

SESSION 11

RM: Golden West . . Wed. 3:30 to 5:30 pm

Pattern Recognition

Chair: **Kensaku Mori**, Nagoya Univ. (Japan)

3:30 pm: **Automated planning of MRI neuro scans,** S. M. Young, D. Bystrov, T. Netsch, Philips Research Labs. (Germany); R. Bergmans, A. van Muiswinkel, F. Visser, R. Sprigorum, Philips Medical Systems (Netherlands); J. Gieseke, Philips Medical Systems (Germany) . . . . . [6144-58]

3:50 pm: **A classification framework for content-based extraction of biomedical objects from hierarchically decomposed images,** C. J. Thies, M. Schmidt-Borreda, T. M. Lehmann, RWTH Aachen (Germany) . . . . . [6144-59]

4:10 pm: **A pattern recognition approach to enhancing structures in 3D CT data,** E. van Rikxoort, B. van Ginneken, Univ. Medisch Ctr. Utrecht (Netherlands) . . . . . [6144-60]

4:30 pm: **Blood detection in wireless capsule endoscopy using expectation maximization clustering,** S. Hwang, J. F. Cox, J. Oh, The Univ. of Texas at Arlington; S. J. Tang, The Univ. of Texas Southwestern Medical Ctr. at Dallas . . . . . [6144-61]

4:50 pm: **Functional feature subspace mapping of fMRI data in the spectral domain,** L. Yang, J. Tian, J. Hu, J. Liu, Institute of Automation (China) . . . . . [6144-62]

5:10 pm: **(ST) Analysis of first-pass myocardial perfusion MRI using independent component analysis,** J. R. Milles, R. J. van der Geest, Leids Univ. Medisch Ctr. (Netherlands); M. Jerosch-Herold, Oregon Health & Science Univ.; J. H. C. Reiber, B. P. F. Lelieveldt, Leids Univ. Medisch Ctr. (Netherlands) . . . . . [6144-63]

5:20 pm: **(ST) Learning image similarity to detect breast cancer,** D. Tahmoush, H. Samet, Univ. of Maryland/College Park . . . . [6144-64]

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✔The following posters will be on display Tuesday and Wednesday, 14-15 February in the Grand Ballroom. The reception for these posters, with authors in attendance at his or her poster, will be Wednesday evening from 5:30 to 7:00 pm. Poster awards will be presented at 6:30 pm during the poster reception.

Conference 6142
Physics of Medical Imaging

X-ray CT

✔ **Data pre-processing for quantification in tomography and radiography with a digital flat panel detector,** J. Rinkel, L. Gerfault, CEA Grenoble (France); F. Estève, INSERM (France); J. Dinten, CEA Grenoble (France) . . . . . [6142-83]

✔ **Flat panel detector-based cone beam CT for dynamic imaging: system evaluation,** R. Ning, D. L. Conover, D. Yang, Y. Yu, W. Cai, X. Lu, Univ. of Rochester . . . . . [6142-84]

✔ **Experimental comparison of cone beam CT (CBCT) reconstruction and multiview reconstruction (MVR) for microangiography (MA) detector system,** V. Patel, A. Kuhls, P. Noel, A. Walczak, C. Ionita, R. Chityala, K. Hoffmann, R. Tranquebar, S. Rudin, Univ. at Buffalo [6142-85]

✔ **Geometry calibration phantom design for 3D imaging,** B. E. H. Claus, General Electric Co. . . . . [6142-86]

✔ **Impact of CT detector pixel-to-pixel crosstalk on image quality,** K. J. Engel, L. Spies, G. Vogtmeier, Philips Research Labs. (Germany); R. P. Luhta, Philips Medical Systems . . . [6142-87]

✔ **The effect of reducing radiation dose with combination x-ray modulation and Boost3D,** M. Kazama, S. Tsukagoshi, M. Okumura, Toshiba Medical Systems Corp. (Japan) . . . . . [6142-88]

✔ **Windmill artifacts analysis in MSCT,** O. Amir, I. Sabo-Napadensky, Philips Medical Systems Technologies Ltd. (Israel) . . . . . [6142-89]

✔ **Amplitude correlated four-dimensional cone beam CT,** J. Lu, X. R. Zhu, The Univ. of Texas M.D. Anderson Cancer Ctr.; P. Munro, Varian Medical Systems, Inc.; T. Pan, The Univ. of Texas M.D. Anderson Cancer Ctr. . . . . [6142-90]

✔ **Combination of CT scanning and fluoroscopy imaging on a flat-panel CT-scanner,** M. Grasruck, Siemens Medical Solutions (Germany); R. Gupta, Massachusetts General Hospital; C. Suess, K. Stierstorfer, S. M. Popescu, T. Flohr, Siemens Medical Solutions (Germany) . [6142-91]

✔ **Comparison measurements of DQE for two flat panel detectors: fluoroscopic detector vs. Cone beam CT detector,** R. Betancourt Benitez, R. Ning, D. L. Conover, Y. Yu, Univ. of Rochester . . . . . [6142-92]

✔ **A possible method for dose reduction in the CT practice,** O. Tischenko, Forschungszentrum für Umwelt und Gesundheit, GmbH (Germany); Y. Xu, Univ. of Oregon; C. Hoeschen, Forschungszentrum für Umwelt und Gesundheit, GmbH (Germany) . . . . . [6142-93]

✔ **Image quality in adult and pediatric phantoms when scanned at different x-ray tube voltages (kV),** W. Huda, K. M. Ogden, E. M. Scalzetti, R. L. Lavallee, Upstate Medical Univ./SUNY; E. Samei, Duke Univ. . . . . [6142-94]

Dual Energy X-ray Imaging

✔ **Dual-energy contrast-enhanced digital mammography (DE-CEDM): optimization on digital subtraction with practical x-ray low / high-energy spectra,** B. Chen, Z. Jing, A. Smith, S. Parikh, Hologic, Inc.; Y. Parisky, Univ. of Southern California . . . . . [6142-95]

✔ **Dual-energy imaging using a digital scanned multi-slit system for mammography: evaluation of a differential beam filtering technique,** H. Bornefalk, Kungliga Tekniska Högskolan (Sweden); M. Hemmendorf, T. Hjärn, Sectra Mamea AB (Sweden) . . . . . [6142-96]

✔ **Nonlinear dual-spectral image fusion for improving cone-beam-CT-based breast cancer detectability,** Z. Chen, R. Ning, D. L. Conover, Y. Yu, Univ. of Rochester . . . . . [6142-97]

✔ **Removal of calcium to improve vascular stenosis diagnosis using dual-energy CT: a feasibility study,** J. Zhang, A. Primak, J. G. Fletcher, C. H. McCollough, Mayo Clinic [6142-98]

✔ **An iteration algorithm in dual-energy x-ray imaging based on polychromatic physics model,** S. Tang, X. Mou, T. Luo, Xi'an Jiaotong Univ. (China) . . . . . [6142-99]

✔ **A computation method of dual-energy x-ray imaging,** X. Mou, S. Tang, W. Hong, Xi'an Jiaotong Univ. (China) . . . . . [6142-100]

X-ray Imaging Detector

✔ **The line-noise-reduction for low dose x-ray fluoroscopy with the flat panel detector,** T. Nakamura, S. Ikeda, K. Suzuki, S. Takenouchi, Hitachi Medical Corp. (Japan) . . . . . [6142-101]

✔ **Light induced degradation in amorphous silicon photodiodes and implications for diagnostic medical imaging applications,** I. Khodami, M. Malhotra, F. Taghibakhsh, Simon Fraser Univ. (Canada); J. A. Rowlands, Sunnybrook and Women's Health Sciences Ctr. (Canada); K. S. Karim, K. Y. Kavanagh, Simon Fraser Univ. (Canada) . . . . . [6142-102]

✔ **Temperature coefficients and noise performance studies for the back-illuminated arrays for medical imaging applications,** A. O. Goushcha, B. Tabbert, I. Goushcha, Semicoa . . . . . [6142-103]

✔ **Novel x-ray image sensor using CsBr:Eu phosphor for computed radiography,** H. Nanto, Kanazawa Institute of Technology (Japan) . . . . . [6142-104]

✔ **Transparent BaCl2:Eu2+ glass-ceramic scintillator,** G. Chen, J. A. Johnson, F. De Carlo, Argonne National Lab.; R. Weber, Containerless Research, Inc.; S. Schweizer, Argonne National Lab. and Univ. Paderborn (Germany); P. J. Newman, D. R. MacFarlane, Monash Univ. (Australia) . . . . . [6142-105]

✔ **Energy-dependent scintillation efficiency of fluorozirconate-based glass-ceramic x-ray detectors,** S. L. Schweizer, S. Köneke, Univ. Paderborn (Germany); G. Chen, J. A. Johnson, F. De Carlo, Argonne National Lab.; R. Weber, Containerless Research Inc. . . . . [6142-106]

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✔ **Centerline-based colon segmentation for CAD of CT colonography,** J. J. Näppi, Massachusetts General Hospital and Harvard Medical School; H. Frimmel, Akademiska Sjukhuset; H. Yoshida, Massachusetts General Hospital . . . . . [6144-200]

✔ **Local pulmonary structure classification for computer-aided nodule detection,** C. Bahlmann, Siemens Corporate Research, Inc.; X. Li, Harvard Univ.; K. Okada, Siemens Corporate Research . . . . . [6144-202]

✔ **Power spectral analysis of mammographic parenchymal patterns,** H. Li, M. L. Giger, O. I. Olopade, The Univ. of Chicago . . . [6144-203]

✔ **Discrimination of malignant lymphomas and leukemia using Radon transform-based higher order spectra and textual features,** M. Celenk, Y. Luo, P. Bejai, Ohio Univ. . . . . [6144-204]

✔ **Computer-aided detection system of breast masses on ultrasound images,** Y. Ikedo, D. Fukuoka, T. Hara, H. Fujita, Gifu Univ. (Japan); E. Takada, Dokkyo Univ. School of Medicine (Japan); T. Endo, Nagoya National Hospital (Japan); T. Morita, Chunichi Hospital (Japan) . . . . . [6144-205]

✔ **Highly-automated computer-aided diagnosis of neurological disorders using functional brain imaging,** P. G. Spetsieris, Y. Ma, V. Dhawan, North Shore Univ. Hospital; J. R. Moeller, Columbia Univ. College of Physicians and Surgeons; D. Eidelberg, North Shore Univ. Hospital . . . . . [6144-206]

✔ **Potential improvement of computerized mass detection on mammograms using a bilateral pairing technique,** S. Paquerault, N. Petrick, K. J. Myers, U.S. Food and Drug Administration; B. Sahiner, H. Chan, Univ. of Michigan [6144-207]

✔ **Mammographic CADx system using an image library with an intelligent agent: a pattern matching approach,** S. B. Lo, Georgetown Univ. Medical Ctr. . . . . [6144-208]

✔ **Regularized discriminate analysis for breast mass detection on full field digital mammograms,** J. Wei, B. Sahiner, Y. Zhang, H. Chan, L. M. Hadjiiski, C. Zhou, J. Ge, Y. Wu, Univ. of Michigan . . . . . [6144-209]

✔ **Characterization of corresponding microcalcification clusters on temporal pairs of mammograms for interval change analysis - comparison of classifiers,** L. M. Hadjiiski, D. Drouillard, H. Chan, B. Sahiner, M. A. Helvie, M. A. Roubidoux, C. Zhou, Univ. of Michigan . . . . . [6144-210]

✔ **Computer-aided detection of clustered microcalcifications on full-field digital mammograms: a two-view information fusion scheme for FP reduction,** J. Ge, B. Sahiner, H. Chan, L. M. Hadjiiski, M. A. Helvie, C. Zhou, J. Wei, Y. Zhang, Univ. of Michigan . . . . . [6144-211]

✔ **Computerized lung nodule detection on screening CT scans: performance on juxta-pleural and internal nodules,** B. Sahiner, L. M. Hadjiiski, H. Chan, C. Zhou, J. Wei, Univ. of Michigan . . . . . [6144-212]

✔ **Detection of blue-white veil areas in dermoscopy images using machine learning techniques,** M. E. Celebi, Y. A. Aslandogan, The Univ. of Texas at Arlington; W. V. Stoecker, Stoecker & Associates . . . . . [6144-213]

✔ **Reducing false-positive detections by combining two stage-1 computer-aided mass detection algorithms,** M. P. Sampat, N. Bedard, P. Stokes, M. Markey, The Univ. of Texas at Austin . . . . . [6144-214]

✔ **Combining texture features from MLO and CC views for mammographic CADx,** S. Gupta, D. Zhang, M. P. Sampat, M. K. Markey, The Univ. of Texas at Austin . . . . . [6144-215]

✔ **The influence of CT dose and reconstruction parameters on automated detection of small pulmonary nodules,** R. Ochs, E. Angel, K. L. Boedeker, I. Petkovska, Univ. of California/Los Angeles; C. Panknin, Siemens Medical Solutions, Inc.; J. G. Goldin, D. R. Aberle, M. F. McNitt-Gray, M. S. Brown, Univ. of California/Los Angeles . . . . . [6144-216]

Mathematical Morphology

✔ **An efficient method for computing mathematical morphology for medical imaging,** M. S. Vaz, Barco Medical Imaging Systems; A. P. Kiraly, Siemens Corporate Research . . . . . [6144-217]

Pattern Recognition

✔ **A whole brain morphometric analysis of changes associated with pre-term birth,** C. E. Thomaz, Centro Univ. da FEI (Brazil); J. P. Boardman, S. Counsell, Imperial College London (United Kingdom); D. L. Hill, Univ. College London (United Kingdom); J. V. Hajnal, A. D. Edwards, M. A. Rutherford, Imperial College London (United Kingdom); D. F. Gillies, Imperial College of Science, Technology & Medicine (United Kingdom); D. Rueckert, Imperial College London (United Kingdom) . . . . . [6144-218]

✔ **Feature-space exploration of pathology images using content-based database visualization,** B. Lessmann, T. W. Nattkemper, A. Degenhard, Univ. Bielefeld (Germany); V. Hans, Evangelisches Krankenhaus Bielefeld gGmbH (Germany) . . . . . [6144-219]

✔ **RANSAC-based EM algorithm for robust detection and segmentation of cylindrical fragments from calibrated C-arm images,** G. Zheng, X. Dong, X. Zhang, Univ. Bern (Switzerland) . . . . . [6144-220]

✔ **Realtime automatic metal extraction of medical x-ray images for contrast improvement,** M. Prangl, C. Spielvogel, H. Hellwagner, Univ. Klagenfurt (Austria); T. Szkaliczki, Computer and Automation Research Institute (Hungary); H. Bischof, Technische Univ. Graz (Austria) . . . . . [6144-221]

✔ **Histological characterization of DCE-MRI breast tumors with histological characterization of DCE-MRI breast tumors with dimensional data reduction,** C. Varini, A. Degenhard, T. W. Nattkemper, Univ. Bielefeld (Germany) [6144-222]

✔ **Characterization of pulmonary nodules features on computer tomography (CT) scans using wavelet coefficients and heatmaps,** T. Osicka, M. T. Freedman, Georgetown Univ. Medical Ctr.; F. Ahmed, The Catholic University of America; S. B. Lo, Georgetown Univ. Medical Ctr. [6144-223]

Quality/Restoration/Deblurring

✔ **A new anisotropic diffusion method with application to partial volume reduction,** O. Salvado, D. L. Wilson, Case Western Reserve Univ. . . . . [6144-224]

✔ **Metal artifacts reduction in CT images through Euler's elastica and curvature based sinogram inpainting,** J. Gu, L. Zhang, Y. Xing, Tsinghua Univ. (China); G. Yu, Nuctech Co. Ltd. (China); Z. Chen, Tsinghua Univ. (China) . . . . . [6144-226]

✔ **A new image calibration technique for colposcopic images,** W. Li, M. Soto-Thompson, H. Lange, STI Medical Systems . . . . . [6144-227]

✔ **Improved MRSI with field inhomogeneity compensation,** I. Khalidov, D. Van De Ville, École Polytechnique Fédérale de Lausanne (Switzerland); M. Jacob, Univ. of Illinois at Urbana-Champaign; F. Lazeyras, Univ. Hospital of Geneva (Switzerland); M. A. Unser, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [6144-228]

✔ **Wavelet-based multiscale level set curve evolution image denoising for MR imaging,** J. Zhong, B. J. Dardzinski, J. Wansapura, Children's Hospital Medical Ctr. . . . . [6144-229]

✔ **ICA domain filtering for reduction of scattered x-ray in cone-beam CT images,** Y. Chen, Ritsumeikan Univ. (Japan); X. Han, Univ. of the Ryukyus (Japan) . . . . . [6144-230]

✔ **Charecterization of high-resolution MR images reconstructed by the GRAPPA parallel technique,** S. Banerjee, S. Majumdar, Univ. of California/San Francisco and Univ. of California/Berkeley . . . . . [6144-231]

✔ **Robust estimation of the noise variance from background MR data,** J. Sijbers, Univ. Antwerpen (Belgium); A. J. den Dekker, Technische Univ. Delft (Netherlands); A. Smolders, J. Van Audekerke, Univ. Antwerpen (Belgium); E. Vandervliet, Univ. Hospital Antwerp (Belgium); A. Van der Linden, Univ. Antwerpen (Belgium) . . . . . [6144-232]

✔ **Improvement of image quality in MDCT by high-frequency sampling of x-, y- and z-direction,** N. Yasuda, Y. Ishikawa, Y. Kodera, Nagoya Univ. (Japan) . . . . . [6144-233]

✔ **Platelets for denoising of SPECT images: phantom and patient study,** N. Alibabaei, A. Takavar, N. Riyahi-Alam, Tehran Univ. of Medical Sciences (Iran); H. R. Ghiasi, Tarbiat Modarres Univ. (Iran); M. Sohrabi, A. Fard-Esfahani, Tehran Univ. of Medical Sciences (Iran) . . . . . [6144-234]

✔ **Automatic detection of specular reflections in uterine cervix images,** G. Zimmerman, H. Greenspan, Tel Aviv Univ. (Israel) . . . [6144-235]

✔ **An improved denoising algorithm based on multi-scale dyadic wavelet transform,** Z. Qi, L. Zhang, Y. Xin, H. Gao, Tsinghua Univ. (China) . . . . . [6144-237]

✔ **A weighted average algorithm for edge-preserving smoothing on MRI images,** R. Jin, L. Zhang, B. Meng, E. Song, X. Xu, Huazhong Univ. of Science and Technology (China); C. Hung, Southern Polytech State Univ. . . . . [6144-238]

✔ **Simulation of susceptibility-induced distortions in fMRI,** N. Xu, Y. Li, C. B. Paschal, C. Gatenby, V. L. Morgan, D. R. Pickens III, B. M. Dawant, J. M. Fitzpatrick, Vanderbilt Univ. . . . . [6144-239]

✔ **Retinal image enhancement based on the human visual system,** B. Raman, K. Belkacem-Boussaid, G. Zamora, Kestrel Corp.; Y. Srinivasan, Texas Tech Univ.; S. Bursell, Harvard Medical School . . . . . [6144-240]

✔ **Prior-information-driven multiple contrast projection of,** S. Rajagopalan, R. A. Robb, Mayo Clinic . . . . . [6144-241]

✔ **Implications of MR contrast standardization on image computing,** S. Rajagopalan, R. A. Robb, Mayo Clinic . . . . . [6144-242]

✔ **Contrast enhancement of soft tissues in computed tomography images,** R. Lerman, D. S. Raicu, J. D. Furst, DePaul Univ. . [6144-243]

✔ **Adaptive conductance filtering for spatially varying noise in PET images,** D. R. Padfield, R. M. Manjeshwar, GE Global Research [6144-244]

✔ **Denoising diffusion tensor images: preprocessing for automated detection of subtle diffusion tensor abnormalities between populations,** T. M. Lee, Univ. of California/Los Angeles . . . . . [6144-245]

✔ **A voxel-based partial volume correction in nuclear medicine,** H. Huang, Chang Gung Univ. (Taiwan); I. Hsiao, Chang Gung Univ. (Taiwan) and Chang Gung Memorial Hospital (Taiwan); C. Wietholt, National Health Research Institutes (Taiwan); C. L. Hsu, National Tsing Hua Univ. (Taiwan) . . . . . [6144-246]

✔ **Detectability improvement of early sign of acute stroke on brain CT images using an adaptive partial smoothing filter,** Y. Lee, Niigata Univ. (Japan); N. Takahashi, Niigata Univ. (Japan) and Sendai City Hospital (Japan); D. Tsai, Niigata Univ. (Japan) . . . . . [6144-247]

✔ **A novel contrast equalization method for chest radiograph,** M. Zhang, X. Mou, Xi'an Jiaotong Univ. (China) . . . . . [6144-248]

✔ **On interpolation of sparsely sampled sinograms,** T. Aach, RWTH Aachen (Germany); S. Schroeder, Georg-August-Univ. Göttingen (Germany); I. Stuke, Univ. zu Lübeck (Germany) . . . . . [6144-249]

✔ **Adaptive multichannel contrast enhancement of mammograms based on human visual system,** K. A. Gandhi, H. Roehrig, M. K. Sundareshan, J. Fan, E. A. Krupinski, The Univ. of Arizona . . . . . [6144-250]

Statistical Methods

✔ **A new post-processing method of applying independent component analysis to fMRI data,** X. Wu, L. Yao, Z. Long, Beijing Normal Univ. (China); K. Chen, Banner Good Samaritan Medical Ctr. . . . . [6144-251]

✔ **Integrating and classifying parametric features from fMRI data for brain function characterization,** Y. M. Wang, C. Zhou, Univ. of Illinois at Urbana-Champaign . . . . . [6144-252]

✔ **Enhanced techniques for asymmetry quantification in brain imagery,** X. Liu, C. Imielinska, Columbia Univ.; J. Rosiene, Eastern Connecticut State Univ.; M. E. Sughrue, A. L. D'Ambrosio, Columbia Univ. . . . . [6144-253]

Texture

✔ **Analysis of the topological properties of the proximal femur on a regional scale: evaluation of multi-detector CT-scans for the assessment of biomechanical strength using local Minkowski functionals in 3D,** H. F. Boehm, Ludwig-Maximilians-Univ. München (Germany); T. M. Link, Univ. of California/San Francisco; R. A. Monetti, Max-Planck-Institut für extraterrestrische Physik (Germany); V. Kuhn, Medizinische Univ. Innsbruck (Austria); F. Eckstein, Paracelsus Medizinische Privatuniversität (Austria); M. Reiser, Ludwig-Maximilians-Univ. München (Germany); C. W. Raeth, Max-Planck-Institut für extraterrestrische Physik (Germany) . . [6144-254]

✔ **Automatic textural feature selection on echocardiographic images,** I. P. Ponce, R. Valdes-Cristerna, Univ. Autonoma Metropolitana (Mexico) . . . . . [6144-255]

✔ **Investigation of temporal radiographic texture analysis for the detection of periprosthetic osteolysis,** J. R. Wilkie, M. L. Giger, The Univ. of Chicago; C. A. Engh, Sr., R. H. Hopper, Jr., Anderson Orthopaedic Research Institute; J. M. Martell, The Univ. of Chicago . . . [6144-256]

✔ **Exploiting 3D volume texture model for automatic detection of diffuse lung disease from multislice computed tomography,** Z. Yao, M. Zhu, Institute of Electronics (China) [6144-258]

Validation

✔ **Fourier-domain based datacentric performance ranking of competing medical image processing algorithms,** S. Rajagopalan, R. A. Robb, Mayo Clinic . . . . . [6144-259]

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PACS and Imaging Informatics

✔ **Content-based medical image retrieval in picture archiving and communication systems,** J. Zhang, Y. Tan, Shanghai Institute of Technical Physics (China); Y. Hua, G. Zhang, Huadong Hospital (China) . . . . . [6145-23]

✔ **The impact of lossless image compression to radiographs,** T. M. Lehmann, RWTH Aachen (Germany); J. Abel, Ingenieurbüro Dr. Abel GmbH (Germany); C. Weiss, RWTH Aachen (Germany) . . . . . [6145-42]

✔ **Development of mobile emergency patient information and imaging communication system for emergency diagnosis based on CDMA-1X EVDO,** K. H. Yang, W. Kang, B. M. Jang, J. I. Kim, D. H. Han, H. Jung, S. Yoo, H. Yoo, H. Kim, Yonsei Univ. (South Korea) . . . . [6145-43]

✔ **Applying XDS for sharing CDA-based medical records,** J. I. Kim, B. M. Jang, D. H. Han, K. H. Yang, W. Kang, H. Jung, H. Kim, Yonsei Univ. (South Korea) . . . . . [6145-44]

✔ **The application of multilayer tree structure in DICOM,** M. Pan, Shanghai Jiao Tong Univ. (China); Z. Yao, Ruijin Hospital (China) . . . . . [6145-45]

✔ **Development of patient collation system by kinetic analysis in chest dynamic radiogram with flat panel detector,** Y. Tsuchiya, Shizuoka Children's Hospital (Japan); Y. Kodera, Nagoya Univ. (Japan) . . . . . [6145-46]

✔ **Operation monitoring and security management in RIS-integrated PACS,** J. Zhang, X. Chen, J. Jin, J. Sun, Y. Yang, C. Liang, Shanghai Institute of Technical Physics (China); H. K. Huang, Univ. of Southern California . . . . . [6145-47]

✔ **Interactive radiological education file system integrated with PACS,** M. J. Shin, Asan Medical Ctr. (South Korea) and VirtualScopics, LLC; I. S. Choi, Asan Medical Ctr. (South Korea) . . . . . [6145-48]

✔ **Sharing medical images: a proposal of a reference image database,** M. dos Santos, Instituto do Coracão do Hospital das Clínicas (Brazil) and Escola Politécnica da Univ. de São Paulo (Brazil); S. S. Furuie, Instituto do Coracão do Hospital das Clínicas (Brazil) and Univ. of Sao Paulo (Brazil) . . . . . [6145-49]

✔ **Automatic orientation correction for radiographs,** H. Luo, J. Luo, Eastman Kodak Co. . . . . [6145-50]

✔ **Implementation of a fault-tolerant PACS over a grid architecture,** M. A. Gutierrez, Instituto do Coracão do Hospital das Clínicas (Brazil); C. S. Santos, Instituto de Matemática e Estatística da Univ. de São Paulo (Brazil); R. Moreno, L. O. Kobayashi, Instituto do Coracão do Hospital das Clínicas (Brazil); S. M. Freire, Univ. do Estado do Rio de Janeiro (Brazil); S. S. Furuie, Instituto do Coracão do Hospital das Clínicas (Brazil) [6145-51]

✔ **Integration of lossless digital signature embedding (LDSE) and patient tracking logs with HIPAA compliant auditing system (HCAS),** Z. Zhou, B. J. Liu, H. K. Huang, B. Guo, J. Documet, N. King, Univ. of Southern California . . . . . [6145-52]

✔ **Rib shape recognition in lung x-ray images for intelligent assistance,** H. Sakaida, A. Oosawa, K. Shimura, Fuji Photo Film Co., Ltd. (Japan) . . . . . [6145-53]

Conference 6146

Image Perception, Observer Performance, and Technology Assessment

✔ **Does mammographic practice affect film reading style: breast screening vs. symptomatic radiologists?,** H. J. Scott, A. G. Gale, Loughborough Univ. (United Kingdom) . [6146-32]

✔ **A proposal of the diagnosis-dynamic characteristic (DDC) model describing the relation between search time and confidence levels and an application for ROC curve generation from a dichotomous judgment,** T. Matsumoto, N. Fukuda, A. Furukawa, National Institute of Radiological Sciences (Japan); K. Suwa, Nippon Dental Univ. (Japan); S. Wada, Niigata Univ. (Japan); M. Matsumoto, Diichi Hospital (Japan); S. Sone, JA Azumi General Hospital (Japan) . . . . . [6146-33]

✔ **Observer performance detecting signals in globally non-stationary oriented noise,** Y. Zhang, C. K. Abbey, M. P. Eckstein, Univ. of California/ Santa Barbara . . . . . [6146-35]

✔ **An applicability research on JND model,** T. Luo, X. Mou, Xi'an Jiaotong Univ. (China) . . . [6146-36]

✔ **How does mass lesion detection vary with lesion size, display window width, and radiation exposure in computed radiography?,** K. M. Ogden, W. Huda, V. Garg, M. Khan, M. A. Reichel, M. L. Roskopf, Upstate Medical Univ./SUNY . . . . . [6146-37]

✔ **First validation of a new phantom for global quality control in digital mammography,** H. T. Bosmans, K. Nijs, Katholieke Univ. Leuven (Belgium); K. C. Young, The Royal Surrey County Hospital NHS Trust (United Kingdom); F. Rogge, Katholieke Univ. Leuven (Belgium); P. Moran, M. L. Chevalier, Univ. Complutense de Madrid (Spain); M. Borowski, Klinikum Braunschweig GmbH (Germany); A. Taibi, Univ. degli Studi di Ferrara (Italy); J. J. Cook, The Royal Surrey County Hospital NHS Trust (United Kingdom); G. Marchal, Katholieke Univ. Leuven (Belgium) . . . . . [6146-38]

✔ **Characterization of a new generation of computed radiography system based on line scanning and phosphor needles,** O. Dragusin, F. Rogge, H. Pauwels, G. Marchal, H. T. Bosmans, Katholieke Univ. Leuven (Belgium) . . . . . [6146-39]

✔ **Potential for lower absorbed dose in digital mammography: a JAFROC experiment using dose-reduced clinical hybrid images,** P. Timberg, M. E. Ruschin, Lunds Univ. (Sweden); M. Båth, Sahlgrenska Univ. Hospital (Sweden); B. Hemdal, I. Andersson, A. Tingberg, Lunds Univ. (Sweden) . . . . . [6146-40]

✔ **Development and implementation of a user friendly and automated environment for the creation of databases of digital mammograms with simulated microcalcifications,** F. Zanca, J. Jacobs, C. Van Ongeval, Univ. Ziekenhuizen Leuven (Belgium); A. G. Carton, Univ. of Pennsylvania; T. J. Deprez, G. Marchal, H. Bosmans, Univ. Ziekenhuizen Leuven (Belgium) . . . . . [6146-41]

✔ **A comparison of 2D and 3D evaluation methods for pulmonary embolism detection in CT images,** A. P. Kiraly, C. L. Novak, Siemens Corporate Research; D. P. Naidich, I. Vlahos, J. P. Ko, G. T. Brusca-Augello, New York Univ. . . . . [6146-42]

✔ **An optimized decision-fusion algorithm for classification of heterogeneous breast cancer data,** J. L. Jesneck, L. W. Nolte, J. Y. Lo, Duke Univ. . . . . [6146-44]

✔ **Comparison of sensitivity and reading time for the use of CAD as concurrent and second reader,** F. Beyer, Westfälische Wilhelms-Univ. Münster (Germany); L. Zierott, K. U. Juergens, E. M. Fallenberg, Univ. Hospital Munster (Germany); J. Stoeckel, Siemens Medical Solutions; W. L. Heindel, D. Wormanns, Westfälische Wilhelms-Univ. Münster (Germany) . . . . . [6146-45]

✔ **Potential effect of CAD systems on the detection of actionable nodules in chest CT scans during routine reporting,** D. Wormanns, F. Beyer, Westfälische Wilhelms-Univ. Münster (Germany); A. Butzbach, Median Technologies (France); L. Zierott, Univ. Hospital Munster (Germany); W. Heindel, Westfälische Wilhelms-Univ. Münster (Germany) . . . . . [6146-46]

✔ **Explanation of the improvement mechanism of diagnostic performance with CAD system in interpreting CT images,** T. Matsumoto, National Institute of Radiological Sciences (Japan); S. Wada, Niigata Univ. (Japan); S. Yamamoto, Chukyo Univ. (Japan); K. Murao, Fujitsu Ltd. (Japan); A. Furukawa, M. Endo, National Institute of Radiological Sciences (Japan); M. Matsumoto, Tokyo Metropolitan Univ. (Japan); S. Sone, JA Azumi General Hospital (Japan) . . . . . [6146-48]

✔ **Presentation of CAD findings to the radiologist: influence of the CAD marker type on radiologist's sensitivity and specificity in detection of lung nodules at chest CT,** D. Wormanns, F. Beyer, S. Diederich, W. L. Heindel, Westfälische Wilhelms-Univ. Münster (Germany) . . . . . [6146-49]

✔ **Automatic image quality assessment for cervical imagery,** J. Gu, W. Li, STI Medical Systems . . . . . [6146-51]

✔ **A study on the performance evaluation of computer-aided diagnosis for detecting pulmonary nodules for the various CT reconstruction,** S. Wada, Niigata Univ. (Japan); T. Matsumoto, National Institute of Radiological Sciences (Japan); K. Murao, Fujitsu Ltd. (Japan); S. Sone, JA Azumi General Hospital (Japan) . . . . . [6146-52]

✔ *For additional Posters see pp. 17-22 for the Sunday/Monday Poster Presentations.*

NOTE: Papers not removed at the designated times willl be considered UNWANTED and will be discarded. SPIE assumes no responsibility for posters left on the poster boards after the designated times.

Conference 6146 *continued*

Image Perception, Observer Performance, and Technology Assessment

ROOM: Pacific Salon III

SESSION 5

RM: Pacific Salon III . . . . . Thurs. 8:00 to 9:40 am

Model Observers

Chair: **Miguel P. Eckstein**, Univ. of California/Santa Barbara

8:00 am: **Human observer models for detection of lung nodules in tomosynthetic images,** A. R. Pineda, Stanford Univ.; A. Kumar, Austin College; S. Yoon, R. Fahrig, Stanford Univ. . . . . [6146-21]

8:20 am: **The efficiency of reading around learned backgrounds,** M. P. Eckstein, Univ. of California/Santa Barbara . . . . . [6146-22]

8:40 am: **Observer efficiency in boundary discrimination tasks related to assessment of breast lesions with ultrasound,** . K. Abbey, Univ. of California/Davis; M. F. Insana, Univ. of Illinois at Urbana-Champaign . . . . . [6146-23]

9:00 am: **Performance of a channelized-ideal observer using Laguerre-Gauss channels for detecting a Gaussian signal at a known location in different lumpy backgrounds,** S. Park, U.S. Food and Drug Administration; E. Clarkson, College of Optical Sciences/The Univ. of Arizona; H. H. Barrett, The Univ. of Arizona; M. A. Kupinski, College of Optical Sciences/The Univ of Arizona; K. J. Myers, U.S. Food and Drug Administration . . . . . [6146-24]

9:20 am: **Human efficiency for detecting Gaussian signals in non-Gaussian distributed lumpy backgrounds using different display characteristics and scaling methods,** S. Park, B. D. Gallas, A. Badano, N. Petrick, K. J. Myers, U.S. Food and Drug Administration . . . . . [6146-25]

Coffee Break . . . . . 9:40 to 10:10 am

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Physics of Medical Imaging

ROOM: San Diego

Focus Session

SESSION 14

RM: San Diego . . . Thurs. 8:00 to 9:40 am

Cone Beam Reconstruction

Chair: **Jeffrey A. Fessler**, Univ. of Michigan

8:00 am: **Extension of the reconstruction field-of-view using sinogram decomposition,** A. A. Zamyatin, M. D. Silver, Bio-Imaging Research, Inc. . . . . [6142-72]

8:20 am: **Suppression of motion-induced streak artifacts along chords in fan-beam BPF-reconstructions of motion-contaminated projection data,** M. King, D. Xia, L. Yu, X. M. Pan, M. L. Giger, The Univ. of Chicago . . . . . [6142-73]

8:40 am: **A new perspective for image reconstructions from parallel- and fan-beam data with truncations,** D. Xia, Y. Zou, X. M. Pan, The Univ. of Chicago . . . . . [6142-74]

9:00 am: **Iterative reconstruction of a region of interest for transmission tomography,** A. Ziegler, T. Nielsen, M. Grass, Philips Research Labs. (Germany) . . . . . [6142-75]

9:20 am: **An iterative algorithm for soft tissue reconstruction from truncated flat panel projections,** D. A. Langan, B. E. Claus, P. M. Edic, GE Global Research; R. Vaillant, GE Healthcare (France); B. De Man, S. Basu, M. Iatrou, GE Global Research . . . . . [6142-76]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: Califronia

SESSION 7

RM: California . . . Thurs. 8:00 to 9:40 am

Data Management and Security

Chair: **Lawrence R. Tarbox**, Washington Univ. in St. Louis

8:00 am: **A tracking and verification system implemented in a clinical environment for partial HIPAA compliance,** B. Guo, J. R. Documet, B. J. Liu, N. King, R. Shrestha, K. Wang, H. K. Huang, Univ. of Southern California . . . . . [6145-30]

8:20 am: **Implementation and integration experiences of a tracking and verification system in a clinical imaging environment,** B. J. Liu, J. Lee, K. Ma, V. Nguyen, J. R. Documet, B. Guo, Univ. of Southern California . . . . . [6145-31]

8:40 am: **Grid-based medical image workflow and archiving for research and enterprise PACS applications,** S. G. Erberich, M. Dixit, V. Chen, A. Chervenak, M. D. Nelson, C. Kesselmann, Univ. of Southern California . . . . . [6145-32]

9:00 am: **Hierarchical storage of large volume of multidetctor CT data using distributed servers,** O. M. Ratib, A. Rosset, J. Heuberger, Univ. Hospital of Geneva (Switzerland) . . . . . [6145-33]

9:20 am: **Tele diagnostic by web,** S. Sugiyama, Gifu Univ. (Japan) . . . . . [6145-34]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6144 *continued*

Image Processing

ROOM: Golden West

Focus Session

SESSION 12

RM: Golden West . Thurs. 8:00 to 9:40 am

CAD I

Chair: **Bram van Ginneken**, Univ. Medical Ctr. Utrecht (Netherlands)

8:00 am: **Probabilistic nodule filtering in thoracic CT scans,** G. Agam, C. Wu, Illinois Institute of Technology . . . . . [6144-65]

8:20 am: **Development of computerized scheme for detection of very subtle lung nodules located in opaque areas on chest radiographs,** J. Shiraishi, K. Doi, The Univ. of Chicago . . . . . [6144-66]

8:40 am: **Computerized detection of pulmonary nodules using a combination of 3D global and local shape information based on helical CT images,** X. Zhang, M. Sonka, The Univ. of Iowa . . . . . [6144-67]

9:00 am: **Automated detection of ureter abnormalities on multidetector row CT urography,** L. M. Hadjiiski, B. Sahiner, E. M. Caoili, R. H. Cohan, H. Chan, Univ. of Michigan . . . . . [6144-68]

9:20 am: **(ST) Biplane correlation imaging for lung nodule detection: initial human subject results,** N. Majdi Nasab, E. Samei, J. T. Dobbins III, Duke Univ. Medical Ctr. . . . [6144-69]

9:30 am: **(ST) A method to increase the number of masses cued by a CAD scheme on both CC and MLO views,** B. Zheng, G. Maitz, J. K. Leader, D. Gur, Univ. of Pittsburgh . . . . . [6144-70]

Coffee Break . . . . . 9:40 to 10:10 am

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Conference 6146 *continued*

Image Perception, Observer Performance, and Technology Assessment

ROOM: Pacific Salon III

SESSION 6

RM: Pacific Salon III . . Thurs. 10:10 am to 12:10 pm

Image Perception

Chair: **Elizabeth A. Krupinski**, The Univ. of Arizona

10:10 am: **Variability in the interpretation of mammograms: Do similar decisions entail similar visual sampling strategies?,** C. Mello-Thoms, Univ. of Pittsburgh . [6146-26]

10:30 am: **Lesion detection using an a-contrario detector in simulated digital mammograms,** B. Grosjean, S. L. Muller, H. Souchay, GE Healthcare (France) . . . . . [6146-27]

10:50 am: **Lesion removal and lesion addition algorithms in lung volumetric data sets for perception studies,** M. T. Madsen, K. S. Berbaum, A. Ellingson, B. H. Thompson, B. Mullan, The Univ. of Iowa [6146-28]

11:10 am: **Mammographic texture synthesis using genetic programming and clustered lumpy background,** C. Castella, Institut Univ. de Radiophysique Appliquée (Switzerland); K. Kinkel, Clinique des Grangettes (Switzerland); F. Descombes, Haute Ecole Cantonale Vaudoise de la Santé (Switzerland); M. P. Eckstein, Univ. of California/Santa Barbara; P. Sottas, F. R. Verdun, F. O. Bochud, Institut Univ. de Radiophysique Appliquée (Switzerland) . . . . . [6146-29]

11:30 am: **Perceptually-limited modality-adaptive medical image watermarking,** A. J. Maeder, B. M. Planitz, Commonwealth Scientific & Industrial Research Organisation (Australia) . . . . . [6146-30]

11:50 am: **Optimum ambient lighting conditions for the viewing of softcopy radiological images,** P. C. Brennan, M. F. McEntee, Univ. College Dublin (Ireland); M. Evanoff, The American Board of Radiology; D. Manning, St. Martin's College (United Kingdom) . . . . . [6146-31]

6146 Ends ■

Conference 6142 *continued*

Physics of Medical Imaging

ROOM: San Diego

Focus Session

SESSION 15

RM: San DiegoThurs. 10:10 am to 12:10 pm

CT Image Reconstruction

Chair: **Thomas Flohr**, Siemens Medical Solutions (Germany)

10:10 am: **Conjugate backprojection approach for cone beam artifact reduction,** J. Hsieh, X. Tang, GE Healthcare . . . . . [6142-77]

10:30 am: **Cone-beam local tomography image reconstruction on chords,** M. A. Anastasio, Illinois Institute of Technology; E. Y. Sidky, Y. Zou, X. M. Pan, The Univ. of Chicago . . . . . [6142-78]

10:50 am: **3D-weighted cone beam filtered backprojection (CB-FBP) algorithm for image reconstruction at low-helical pitches to improve noise characteristics and dose efficiency,** X. Tang, J. Hsieh, R. A. Nilsen, GE Healthcare . . . . . [6142-79]

11:10 am: **ROI image reconstruction from truncated projections along a circle-arc trajectory,** Y. Zou, D. Xia, X. M. Pan, The Univ. of Chicago . . . . . [6142-80]

11:30 am: **Accurate image reconstruction from few views in C-arm CT,** E. Y. Sidky, X. Pan, C. Y. Kao, The Univ. of Chicago . . . . . [6142-81]

11:50 am: **A new reconstruction algorithm for Radon data,** Y. Xu, Univ. of Oregon; O. Tischenko, C. Hoeschen, GSF-Forschungszentrum (Germany) . . . . . [6142-82]

Lunch Break . . . . . 12:10 to 1:20 pm

Workshop

RM: San Diego . . . . Thurs. 1:20 to 3:00 pm

Volumetric Reconstruction for X-ray CT

Speaker: **Andy Ziegler**, Philips GmbH (Germany)

Methods to reconstruct 3D computed tomography (CT) image data from multi-slice and cone-beam x-ray CT systems are explained and compared. Experts will outline methods for those not familiar with image recontruction, provide programming examples for those having some familiarity with software, and illustrate the performance achieved with specific solutions. Methods considered will include filtered-backprojection and interative solutions suitable for cone-beam acquisitions with either circular or helical trajectories. Available public domain software and acceleration hardware will be identified.

6142 Ends ■

Conference 6145 *continued*

PACS and Imaging Informatics

ROOM: California

SESSION 8

RM: California . Thurs. 10:10 am to 12:10 pm

Clinical Applications

Chair: **Steven C. Horii**, Univ. of Pennsylvania

10:10 am: **Computer-aided diagnosis workstation and data base system for chest diagnosis based on multihelical CT images,** H. Satoh, Oyama National College (Japan); N. Niki, The Univ. of Tokushima (Japan) . . . . . [6145-35]

10:30 am: **Carpal bone analysis in bone age assessment,** A. Zhang, A. Gertych, B. J. Liu, Univ. of Southern California; S. Kurkowska-Pospiech, Politechnika Slaska (Poland); H. K. Huang, Univ. of Southern California . . . . . [6145-36]

10:50 am: **Using irreversible compression in digital radiology: a preliminary study of the opinions of radiologists,** E. Seeram, British Columbia Institute of Technology (Canada) . . . . . [6145-37]

11:10 am: **A mouse imaging collaboration environment,** J. Szymanski, Case Western Reserve Univ.; C. Flask, Univ. Hospitals of Cleveland; D. L. Wilson, G. Zhang, D. Johnson, Case Western Reserve Univ. . . . . [6145-38]

11:30 am: **Impact of volumetric ultrasound on PACS,** S. C. Horii, A. Goldszal, R. O. Redfern, B. Coleman, J. Langer, D. Morton, S. Rowling, W. W. Boonn, C. Iyoob, Univ. of Pennsylvania . . . . . [6145-39]

11:50 am: **The impact of dose reduction for subtraction CT angiography of the head and neck using a low dose simulator,** P. A. Vandermeer, Univ. of Maryland Medical System and VA Maryland Health Care System; W. W. Boonn, Univ. of Pennsylvania; K. M. Siddiqui, VA Maryland Health Care System; N. M. Safdar, Univ. of Maryland Medical System; N. S. Amiridze, VA Maryland Health Care System; R. Shekhar, Univ. of Maryland Medical System; E. L. Siegel, VA Maryland Health Care System . . . . . [6145-40]

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

SESSION 9

Room: California . Thurs. 1:20 to 2:00 pm

Special Session on Radiology for Non-Radiologists

Chair: **Steven C. Horii**, Univ. of Pennsylvania

1:20 pm: **The top ten things you need to know about radiologists: what radiologists do and how they think they do it,** S. C. Horii, Univ. of Pennsylvania . . . . . [6145-41]

6145 Ends ■

Conference 6144 *continued*

Image Processing

ROOM: Golden West

Focus Session

SESSION 13

RM: Golden West Thurs. 10:10 am to 12:10 pm

CAD II

Chair: **Mary S. Pastel**, Food and Drug Administration

10:10 am: **Reconstruction-independent 3D CAD for mass detection in digital breast tomosynthesis using fuzzy particles,** G. Peters, S. L. Muller, S. Bernard, R. Iordache, GE Healthcare (France); I. Bloch, Ecole Nationale Supérieure de Télécommunications (France) . . . . . [6144-71]

10:30 am: **Micro-calcification detection in digital tomosynthesis mammography,** F. W. Wheeler, A. A. Perera, B. E. Claus, GE Global Research; S. L. Muller, G. Peters, GE Healthcare (France); J. P. Kaufhold, Science Applications International Corp. . . . . [6144-72]

10:50 am: **Computer-aided detection of breast masses on mammograms: bilateral analysis for false positive reduction,** Y. Wu, L. M. Hadjiiski, J. Wei, C. Zhou, B. Sahiner, H. Chan, Univ. of Michigan . . . . . [6144-73]

11:10 am: **Digital bowel cleansing for computer-aided detection of polyps in fecal-tagging CT colonography,** W. Cai, J. J. Nappi, M. Zalis, H. Yoshida, Massachusetts General Hospital and Harvard Medical School . . . . [6144-74]

11:30 am: **Quantitative analysis of two-phase 3D and time aortic MR images,** F. Zhao, H. Zhang, N. E. Walker, F. Yang, M. E. Olszewski, T. D. Scholz, M. Sonka, The Univ. of Iowa . . . . . [6144-75]

11:50 am: **(ST) Two-view information fusion for improvement of computer-aided detection (CAD) of breast masses on mammograms,** J. Wei, B. Sahiner, L. M. Hadjiiski, H. Chan, M. A. Helvie, M. A. Roubidoux, C. Zhou, J. Ge, Y. Zhang, Univ. of Michigan . . . . . [6144-76]

12:00 pm: **(ST) Comparison of breast ductal branching pattern classification using x-ray galactograms and MR autogalactograms,** P. R. Bakic, M. A. Rosen, A. D. Maidment, Univ. of Pennsylvania . . . . . [6144-77]

Lunch Break . . . . . 12:10 to 1:20 pm

Workshop

RM: Golden West . . . Thurs. 1:20 to 2:20 pm

What Can We Expect from a Computer in the Interpretation of Medical Images?

Moderator: **Maryellen L. Giger**, The Univ. of Chicago

Presentations Only

1:20 pm: **Current performance levels of CADe and CADx systems: without and with the human,** D. Gur, Univ. of Pittsburgh; H. Chan, Univ. of Michigan

1:40 pm: **Opportunities for improved computer performance,** R. M. Nishikawa, The Univ. of Chicago; J. Y. Lo, Duke Univ.

2:00 pm: **What actually do radiologists want?** H. L. Kundel, S. C. Horii, Univ. of Pennsylvania

6144 Ends ■

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