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Contents

Part One

xxi Introduction

xxx Fortieth Anniversary of SPIE Medical Imaging Meeting (Overview Paper)
R. M. Nishikawa, Carl J. Vyborny Translation Lab. for Breast Imaging Research, The Univ. of Chicago (United States)

SESSION 1 VISUALIZATION, SEGMENTATION, AND REGISTRATION

8316 02 Deformable registration of the inflated and deflated lung for cone-beam CT-guided thoracic surgery [8316-01]
A. Uneri, S. Nithiananthan, S. Schafer, Y. Otake, J. W. Stayman, The Johns Hopkins Univ. (United States); G. Kleinszig, Siemens Healthcare (Germany); M. S. Sussman, Johns Hopkins Bayview Medical Ctr. (United States); R. H. Taylor, J. L. Prince, J. H. Siewerdsen, The Johns Hopkins Univ. (United States)

8316 03 Incorporation of prior knowledge for region of change imaging from sparse scan data in image-guided surgery [8316-02]

8316 04 GPU-based iterative relative fuzzy connectedness image segmentation [8316-03]
Y. Zhuge, National Institutes of Health (United States); J. K. Udupa, Univ. of Pennsylvania (United States); K. C. Ciesielski, Univ. of Pennsylvania (United States) and West Virginia Univ. (United States); A. X. Falcã, Univ. of Campinas (Brazil); P. A. V. Miranda, Univ. of São Paulo (Brazil); R. W. Miller, National Institutes of Health (United States)

8316 05 Automatic anatomy recognition via fuzzy object models [8316-04]
J. K. Udupa, D. Odhner, Univ. of Pennsylvania (United States); A. X. Falcã, Univ. of Campinas (Brazil); K. C. Ciesielski, Univ. of Pennsylvania (United States) and West Virginia Univ. (United States); P. A. V. Miranda, Univ. of Campinas (Brazil); M. Matsumoto, Univ. of Pennsylvania (United States) and Saint Joseph's Univ. (United States); B. Saboury, Hospital of the Univ. of Pennsylvania (United States) and Univ. of Pennsylvania (United States); D. A. Torigian, Hospital of the Univ. of Pennsylvania (United States)

8316 06 Automated volume of interest delineation and rendering of cone beam CT images in interventional cardiology [8316-05]
C. Lorenz, D. Schãfer, Philips Research Labs. (Germany); P. Eshuis, Philips Healthcare (Netherlands); J. Carroll, Univ. of Colorado (United States); M. Grass, Philips Research Labs. (Germany)
SESSION 2 TRACKING AND RADIATION THERAPY

8316 07 Error prediction for probes guided by means of fixtures [8316-06]
J. M. Fitzpatrick, Vanderbilt Univ. (United States)

8316 08 A novel fully automatic system for the evaluation of electromagnetic tracker [8316-07]
I. Gergel, J. Gaa, M. Müller, H.-P. Meinzer, I. Wegner, German Cancer Research Ctr. (Germany)

8316 09 Tracker-on-C for cone-beam CT-guided surgery: evaluation of geometric accuracy and clinical applications [8316-08]
S. Reaungamornrat, Y. Otake, A. Uneri, S. Schafer, D. J. Mirota, S. Nithiananthan, J. W. Stayman, The Johns Hopkins Univ. (United States); A. J. Khanna, The Johns Hopkins Univ. (United States) and The Johns Hopkins Medical Institute (United States); D. D. Reh, The Johns Hopkins Univ. (United States); G. L. Gallia, Johns Hopkins Medical Institute (United States); R. H. Taylor, J. H. Siewerdsen, The Johns Hopkins Univ. (United States)

8316 0A Application of 3D surface imaging in breast cancer radiotherapy [8316-09]

8316 0B Improvement of tracking accuracy and stability by recursive image processing in real-time tumor-tracking radiotherapy system [8316-10]
N. Miyamoto, K. Sutherland, Hokkaido Univ. (Japan); R. Suzuki, Hokkaido Univ. Hospital (Japan); T. Matsura, C. Toramatsu, S. Takao, H. Nihongi, R. Kinoshita, S. Shimizu, R. Onimaru, K. Umegaki, H. Shirato, M. Ishikawa, Hokkaido Univ. (Japan)

8316 0C Model-based risk assessment for motion effects in 3D radiotherapy of lung tumors [8316-11]
R. Werner, J. Ehrhardt, A. Schmidt-Richberg, H. Handels, Univ. of Lübeck (Germany)

SESSION 3 KEYNOTE AND ROBOTICS

8316 0D Medical robotics and computer-integrated interventional medicine (Keynote Paper) [8316-12]
R. H. Taylor, The Johns Hopkins Univ. (United States)

8316 0E Does a robotic scrub nurse improve economy of movements? [8316-13]
J. P. Wachs, M. Jacob, Y.-T. Li, Purdue Univ. (United States); G. Akingba, Indiana Univ. (United States)

8316 0F The role of three-dimensional visualization in robotics-assisted cardiac surgery [8316-14]
M. Currie, London Health Sciences Ctr. (Canada); A. L. Trejos, The Univ. of Western Ontario (Canada); R. Rayman, M. W. A. Chu, London Health Sciences Ctr. (Canada); R. Patel, The Univ. of Western Ontario (Canada) and Canadian Surgical Technologies and Advanced Robotics, Lawson Health Research Institute (Canada); T. Peters, Robarts Research Institute (Canada); B. Kiaii, The Univ. of Western Ontario (Canada)
SESSION 4 SIMULATION AND MODELING

8316 0G Evaluation of deformation accuracy of a virtual pneumoperitoneum method based on clinical trials for patient-specific laparoscopic surgery simulator [8316-15]
M. Oda, J. D. Qu, Y. Nimura, Nagoya Univ. (Japan); T. Kitasaka, Aichi Institute of Technology (Japan); K. Misawa, Aichi Cancer Ctr. (Japan); K. Mori, Nagoya Univ. (Japan)

8316 0H Neurosurgery simulation using non-linear finite element modeling and haptic interaction [8316-16]
H.-P. Lee, Kitware, Inc. (United States) and Univ. of North Carolina at Chapel Hill (United States); M. Audette, Old Dominion Univ. (United States); G. R. Joldes, The Univ. of Western Australia (Australia); A. Enquobahrie, Kitware, Inc. (United States)

8316 0I Lung tumor motion prediction during lung brachytherapy using finite element model [8316-17]
Z. Shirzadi, The Univ. of Western Ontario (Canada); A. Sadeghi Naini, A. Samani, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada)

8316 0J A method for constructing real-time FEM-based simulator of stomach behavior with large-scale deformation by neural networks [8316-18]
K. Morooka, T. Taguchi, Kyushu Univ. (Japan); X. Chen, Yamaguchi Univ. (Japan); R. Kurazume, M. Hashizume, T. Hasegawa, Kyushu Univ. (Japan)

8316 0K Pectus excavatum postsurgical outcome based on preoperative soft body dynamics simulation [8316-19]
A. H. J. Moreira, P. L. Rodrigues, Univ. of Minho (Portugal) and ICVS/3B's, PT Government Associate Lab. (Portugal); J. Fonseca, A. C. M. Pinho, Univ. of Minho (Portugal); N. F. Rodrigues, Polytechnic Institute of Cávado and Ave (Portugal) and Univ. of Minho (Portugal); J. Correia-Pinto, Univ. of Minho (Portugal) and ICVS/3B's, PT Government Associate Lab. (Portugal); J. L. Vilaça, Univ. of Minho (Portugal) and ICVS/3B's, PT Government Associate Lab. (Portugal) and Polytechnic Institute of Cávado and Ave (Portugal)

8316 0L Fusion of intraoperative force sensing, surface reconstruction and biomechanical modeling [8316-20]
S. Röhl, S. Bodenstedt, C. Küderle, S. Suwelack, Karlsruhe Institute of Technology (Germany); H. Kenngott, B. P. Müller-Stich, Heidelberg Univ. Hospital (Germany); R. Dillmann, S. Speidel, Karlsruhe Institute of Technology (Germany)

SESSION 5 2D/3D AND FLUOROSCOPY

8316 0M Robust pigtail catheter tip detection in fluoroscopy [8316-21]
S. Tzoumas, P. Wang, Y. Zheng, Siemens Corp. (United States); M. John, Siemens AG (Germany); D. Comaniciu, Siemens Corp. (United States)

8316 0N Automatic localization of target vertebras in spine surgery using fast CT-to-fluoroscopy (3D-2D) image registration [8316-22]
Y. Otake, S. Schafer, J. W. Stayman, W. Zbijewski, The Johns Hopkins Univ. (United States); G. Kleinszig, R. Graumann, Siemens AG (Germany); A. J. Khanna, The Johns Hopkins Medical Institute (United States); J. H. Siewersen, The Johns Hopkins Univ. (United States)
2D-3D rigid registration to compensate for prostate motion during 3D TRUS-guided biopsy [8316-23]
T. De Silva, A. Fenster, J. Bax, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); L. Gardi, C. Romagnoli, Robarts Research Institute (Canada); J. Samarabandu, The Univ. of Western Ontario (Canada); A. D. Ward, The Univ. of Western Ontario (Canada) and London Health Sciences Ctr. (Canada)

Error analysis of the x-ray projection geometry of camera-augmented mobile C-arm [8316-24]
X. Chen, L. Wang, P. Fallavollita, N. Navab, Technical Univ. of Munich (Germany)

Automatic pose initialization for accurate 2D/3D registration applied to abdominal aortic aneurysm endovascular repair [8316-25]
S. Miao, J. Lucas, R. Liao, Siemens Corp. (United States)

Tracked 3D ultrasound targeting with an active cannula [8316-26]
P. J. Swaney, J. Burgner, T. S. Pheiffer, D. C. Rucker, H. B. Gilbert, J. E. Ondrake, A. L. Simpson, Vanderbilt Univ. (United States); E. C. Burdette, Acoustic Medsystems, Inc. (United States); M. I. Miga, R. J. Webster III, Vanderbilt Univ. (United States)

Intraoperative ultrasound to stereocamera registration using interventional photoacoustic imaging [8316-27]

Registration of partially overlapping surfaces for range image based augmented reality on mobile devices [8316-28]

The Kinect as an interventional tracking system [8316-29]
X. L. Wang, P. J. Stolka, The Johns Hopkins Univ. (United States); E. Boctor, The Johns Hopkins Univ. (United States) and The Johns Hopkins Medical Institute (United States); G. Hager, The Johns Hopkins Univ. (United States); M. Choti, The Johns Hopkins Medical Institute (United States)

Feasibility of optical detection of soft tissue deformation during needle insertion [8316-30]
C. Otte, G. Hüttmann, A. Schlaefer, Univ. of Lübeck (Germany)

Surgical motion characterization in simulated needle insertion procedures [8316-31]
M. S. Holden, T. Ungi, D. Sargent, R. C. McGraw, G. Fichtinger, Queen’s Univ. (Canada)
Measurement of distances between anatomical structures using a translating stage with mounted endoscope [8316-32]
L. A. Kahrs, G. S. Blachon, R. Balachandran, Vanderbilt Univ. Medical Ctr. (United States);
J. M. Fitzpatrick, Vanderbilt Univ. (United States); R. F. Labadie, Vanderbilt Univ. Medical Ctr. (United States)

Keyframe selection for robust pose estimation in laparoscopic videos [8316-33]
U. von Öhsen, J. M. Marcinczak, A. F. Márímol Vélez, R.-R. Grigat, Technische Univ. Hamburg-Harburg (Germany)

Improving interaction in navigated surgery by combining a pan-tilt mounted laser and a pointer with triggering [8316-34]
D. Ojdanić, L. Chen, H.-O. Peitgen, Fraunhofer MEVIS (Germany)

An elastic registration framework to estimate prostate deformation in endorectal MR scans [8316-35]
M. Lin, V. Parthasarathy, H. K. Agarwal, Philips Research North America (United States);
P. L. Choyke, B. Turkbey, National Institutes of Health (United States); T. Klinder, J. Kruecker, Philips Research North America (United States)

Implicit active contours for automatic brachytherapy seed segmentation in fluoroscopy [8316-36]
E. Moult, Queen's Univ. (Canada); C. Burdette, Acoustic Medsystems, Inc. (United States);
D. Song, The Johns Hopkins Hospital (United States); G. Fichtinger, Queen's Univ. (Canada);
P. Fallavollita, Technische Univ. München (Germany)

Deformable prostate registration from MR and TRUS images using surface error driven FEM models [8316-37]
F. Taquee, The Univ. of British Columbia (Canada); O. Goks, ETH (Switzerland);
S. S. Mahdavi, The Univ. of British Columbia (Canada); M. Keyes, W. J. Morris, I. Spadinger, British Columbia Cancer Agency (Canada); S. Salcudean, The Univ. of British Columbia (Canada)

A molecular image-directed, 3D ultrasound-guided biopsy system for the prostate [8316-38]
B. Fei, Emory Univ. (United States) and Georgia Institute of Technology (United States);
D. M. Schuster, V. Master, H. Akbari, Emory Univ. (United States); A. Fenster, Robarts Research Institute (Canada); P. Nieh, Emory Univ. (United States)

Development and preliminary evaluation of an ultrasonic motor actuated needle guide for 3T MRI-guided transperineal prostate interventions [8316-39]
S.-E. Song, J. Tokuda, K. Tuncali, C. Tempany, N. Hata, Brigham and Women's Hospital (United States) and Harvard Medical School (United States)
SESSION 9  CARDIAC AND VASCULAR

8316 15 Towards real-time 3D US-CT registration on the beating heart for guidance of minimally invasive cardiac interventions [8316-40]
F. Li, P. Lang, M. Rajchl, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); E. C. S. Chen, Robarts Research Institute (Canada); G. Guiraudon, Robarts Research Institute (Canada), Lawson Health Research Institute (Canada), and The Univ. of Western Ontario (Canada); T. M. Peters, The Univ. of Western Ontario (Canada), Robarts Research Institute (Canada), and Lawson Health Research Institute (Canada)

8316 16 Multi-sequence magnetic resonance imaging integration framework for image-guided catheter ablation of scar-related ventricular tachycardia [8316-41]
Q. Tao, J. Milles, C. van Huls van Taxis, J. H. C. Reiber, K. Zeppenfeld, R. J. van der Geest, Leiden Univ. Medical Ctr. (Netherlands)

8316 17 An augmented reality platform for planning of minimally invasive cardiac surgeries [8316-42]
E. C. S. Chen, K. Sarkar, J. S. H. Baxter, J. Moore, C. Wedlake, Robarts Research Institute (Canada); T. M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)

8316 18 Extended contrast detection on fluoroscopy and angiography for image-guided trans-catheter aortic valve implantations (TAVI) [8316-43]
Y. Liu, R. Liao, X. Lv, Siemens Corporate Research (United States)

8316 19 Multiple capture locations for 3D ultrasound-guided robotic retrieval of moving bodies from a beating heart [8316-44]
P. Thienphrapa, Philips Research North America (United States) and The Johns Hopkins Univ. (United States); B. Ramachandran, H. Elhawary, Philips Research North America (United States); R. H. Taylor, The Johns Hopkins Univ. (United States); A. Popovic, Philips Research North America (United States)

8316 1A Coronary arteries motion modeling on 2D x-ray images [8316-45]
Y. Gao, H. Sundar, Siemens Corporate Research (United States)

SESSION 10  NEURO AND HEAD

8316 1B Variability of the temporal bone surface’s topography: implications for otologic surgery [8316-46]
J. Leceouer, J. H. Noble, Vanderbilt Univ. (United States); R. Balachandran, R. F. Labadie, Vanderbilt Univ. Medical Ctr. (United States); B. M. Dawant, Vanderbilt Univ. (United States)

8316 1C Registering stereovision surface with preoperative magnetic resonance images for brain shift compensation [8316-47]
X. Fan, S. Ji, Dartmouth College (United States); A. Hartov, D. Roberts, K. Paulsen, Dartmouth College (United States) and Dartmouth Hitchcock Medical Ctr. (United States)

8316 1D A surgeon specific automatic path planning algorithm for deep brain stimulation [8316-48]
Automatic pre- to intra-operative CT registration for image-guided cochlear implant surgery [8316-49]
F. A. Reda, B. M. Dawant, Vanderbilt Univ. (United States); R. F. Labadie, Vanderbilt Univ. Medical Ctr. (United States); J. H. Noble, Vanderbilt Univ. (United States)

A system for saccular intracranial aneurysm analysis and virtual stent planning [8316-50]
S. Baloch, S. Sudarsky, Y. Zhu, A. Mohamed, B. Geiger, Siemens Corporate Research (United States); K. Dutta, D. Namburu, P. Nias, G. Martucci, Siemens (United States); T. Redel, Siemens AG (Germany)

SESSION 11  LUNG AND LIVER

Bronchoscopy guidance system based on bronchoscope-motion measurements [8316-51]
D. C. Cornish, W. E. Higgins, The Pennsylvania State Univ. (United States)

Planning and visualization methods for effective bronchoscopic target localization [8316-52]
J. D. Gibbs, Broncus Technologies, Inc. (United States) and The Pennsylvania State Univ. (United States); P. Taeprasarsit, Silpakorn Univ. (Thailand) and The Pennsylvania State Univ. (United States); W. E. Higgins, The Pennsylvania State Univ. (United States)

High-performance C-arm cone-beam CT guidance of thoracic surgery [8316-53]
S. Schafer, Y. Otake, A. Uneri, D. J. Mirotta, S. Nithiananthan, J. W. Stayman, W. Zbijewski, The Johns Hopkins Univ. (United States); G. Kleinszig, R. Graumann, Siemens Healthcare (Germany); M. Sussman, The Johns Hopkins Medical Institute (United States); J. H. Siewerdsen, The Johns Hopkins Univ. (United States)

Fast CT-CT fluoroscopy registration with respiratory motion compensation for image-guided lung intervention [8316-54]
P. Su, Northwestern Polytechnical Univ. (China) and The Methodist Hospital Research Institute (United States); Z. Xue, The Methodist Hospital Research Institute (United States); K. Lu, Philips Research North America (United States); J. Yang, Northwestern Polytechnical Univ. (China); S. T. Wong, The Methodist Hospital Research Institute (United States)

POSTER SESSION: VISUALIZATION, SEGMENTATION, AND REGISTRATION

Application of unscented Kalman filter for robust pose estimation in image-guided surgery [8316-55]
A. Vaccarella, E. De Momi, M. Valenti, G. Ferrigno, Politecnico di Milano (Italy); A. Enquobahrie, Kitware, Inc. (United States)

Interactive GPU volume raycasting in a clustered graphics environment [8316-56]
C. Noon, E. Foo, E. Winer, Iowa State Univ. (United States)

Robust and efficient fiducial tracking for augmented reality in HD-laparoscopic video streams [8316-57]
M. Müller, A. Groch, M. Baumhauer, L. Maier-Hein, German Cancer Research Ctr. (Germany); D. Teber, Univ. of Heidelberg (Germany); J. Rassweller, SLK Kliniken Heilbronn (Germany); H.-P. Meinzer, I. Wegner, German Cancer Research Ctr. (Germany)
Nonlinear ray tracing for vessel enhanced visualization [8316-58]
F. Qiu, W. Hong, Siemens Corp. (United States)

Graph-based surface extraction of the liver using locally adaptive priors for multimodal interventional image registration [8316-59]
S. Kadoury, Philips Research North America (United States); B. J. Wood, A. M. Venkatesan, National Institutes of Health (United States); R. Ardon, Philips Medisys Research Lab. (France); J. Jago, Philips Healthcare (United States); J. Kruecker, Philips Research North America (United States)

Probabilistic registration of an unbiased statistical shape model to ultrasound images of the spine [8316-60]
A. Rasoulian, R. N. Rohling, P. Abolmaesumi, The Univ. of British Columbia (Canada)

Part Two

POSTER SESSION: TRACKING AND RADIATION THERAPY

Automatic patient alignment for prostate radiation applying 3D ultrasound [8316-61]
M. Kaar, A. Kratochwil, M. Figl, R. Hoffmann, A. Bhatia, A. Bhatia, W. Birkfellner, Medical Univ. of Vienna (Austria); J. Hummel, Medical Univ. of Vienna (Austria) and Wilhelminenspital (Austria)

Automated fiducial marker planning for thoracic stereotactic body radiation therapy [8316-62]
J. D. Gibbs, L. Rai, H. Wibowo, S. Tsalyuk, Broncus Technologies, Inc. (United States); E. D. Anderson, Georgetown Univ. Hospital (United States)

Repeatable assessment protocol for electromagnetic trackers [8316-63]
T. Haidegger, B. Sirokai, G. Fenyesi, L. Kovács, B. Benyó, Z. Benyó, Budapest Univ. of Technology and Economics (Hungary)

A quantitative assessment of using the Kinect for Xbox 360 for respiratory surface motion tracking [8316-64]
M. Alnowami, Univ. of Surrey (United Kingdom); B. Alnwaimi, Effat Univ. (Saudi Arabia); F. Tahavori, M. Copland, K. Wells, Univ. of Surrey (United Kingdom)

POSTER SESSION: ROBOTICS

A high accuracy multi-image registration method for tracking MRI-guided robots [8316-66]
W. Shang, G. S. Fischer, Worcester Polytechnic Institute (United States)

System for robot-assisted real-time laparoscopic ultrasound elastography [8316-67]
S. Billings, N. Deshmukh, H. J. Kang, R. Taylor, The Johns Hopkins Univ. (United States); E. M. Boctor, The Johns Hopkins Univ. (United States) and The Johns Hopkins Medical Institute (United States)
8316 1X  Magnetic resonance imaging properties of multimodality anthropomorphic silicone rubber phantoms for validating surgical robots and image guided therapy systems [8316-68]
C. L. Cheung, T. Looi, J. Drake, P. C. W. Kim, The Hospital for Sick Children (Canada)

8316 1Y  Enabling technologies for natural orifice transluminal endoscopic surgery (N.O.T.E.S) using robotically guided elasticity imaging [8316-69]
H. T. Şen, N. Deshmukh, The Johns Hopkins Univ. (United States); R. Goldman, Columbia Univ. (United States); P. Kazanzides, R. H. Taylor, E. Doctor, The Johns Hopkins Univ. (United States); N. Simaan, Vanderbilt Univ. (United States)

8316 1Z  A networked modular hardware and software system for MRI-guided robotic prostate interventions [8316-70]
H. Su, W. Shang, K. Harrington, A. Camilo, G. Cole, Worcester Polytechnic Institute (United States); J. Tokuda, N. Hata, C. Tempany, Brigham and Women's Hospital (United States); G. S. Fischer, Worcester Polytechnic Institute (United States)

8316 20  3D catheter reconstruction using non-rigid structure-from-motion and robotics modeling [8316-71]
C. Papalazarou, Eindhoven Univ. of Technology (Netherlands); P. M. J. Rongen, Philips Healthcare (Netherlands); P. H. N. de With, Eindhoven Univ. of Technology (Netherlands)

POSTER SESSION: SIMULATION AND MODELING

8316 21  Initial study of breast tissue retraction toward image guided breast surgery [8316-72]
M. J. Shannon, Vanderbilt Univ. (United States); I. M. Meszoely, Vanderbilt Univ. Medical Ctr. (United States); J. E. Ondrake, T. S. Pheiffer, A. L. Simpson, K. Sun, Vanderbilt Univ. (United States); M. I. Miga, Vanderbilt Univ. (United States) and Vanderbilt Univ. Medical Ctr. (United States)

8316 22  Procedural wound geometry and blood flow generation for medical training simulators [8316-73]
R. Aras, Y. Shen, J. Li, Old Dominion Univ. (United States)

8316 23  Explicit contact modeling for surgical computer guidance and simulation [8316-74]
S. F. Johnsen, Univ, College London (United Kingdom); Z. A. Taylor, Univ. of Sheffield (United Kingdom); M. Clarkson, S. Thompson, M. Hu, Univ, College London (United Kingdom); K. Gurusamy, B. Davidson, Royal Free Hospital (United Kingdom); D. J. Hawkes, S. Ourselin, Univ, College London (United Kingdom)

POSTER SESSION: 2D/3D AND FLUOROSCOPY

8316 24  Fluoroscopic image-guided intervention system for transbronchial localization [8316-75]
L. Rai, T. M. Keast, H. Wibowo, K.-C. Yu, J. W. Draper, J. D. Gibbs, Broncus Technologies, Inc. (United States)

8316 25  A C-arm calibration method with application to fluoroscopic image-guided procedures [8316-76]
L. Rai, J. D. Gibbs, H. Wibowo, Broncus Technologies, Inc. (United States)
Real-time motion-adjusted augmented fluoroscopy system for navigation during electrophysiology procedures [8316-77]
A. P. Kiraly, J. Barbot, W. Wu, T. Chen, Siemens Corporate Research (United States); A. Brost, M. Koch, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); C. Jakob, T. Kurzendorfer, N. Strobel, Siemens AG (Germany)

Navigation for fluoroscopy-guided cryo-balloon ablation procedures of atrial fibrillation [8316-78]
F. Bourier, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany); A. Brost, A. Kleinoeder, T. Kurzendorfer, M. Koch, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); A. Kiraly, Siemens Corporate Research (Germany); H.-J. Schneider, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany); J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and School in Advanced Optical Technologies (Germany); N. Strobel, Siemens AG (Germany); K. Kurzidim, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany)

Assessing 3D tunnel position in ACL reconstruction using a novel single image 3D-2D registration [8316-79]
X. Kang, The Univ. of Hong Kong (Hong Kong, China) and The Johns Hopkins Univ. (United States); W. P. Yau, The Univ. of Hong Kong (Hong Kong, China); Y. Otake, The Johns Hopkins Univ. (United States); P. Y. S. Cheung, Y. Hu, The Univ. of Hong Kong (Hong Kong, China); R. H. Taylor, The Johns Hopkins Univ. (United States)

Intensity-based 3D/2D registration for percutaneous intervention of major aorto-pulmonary collateral arteries [8316-80]
J. Couet, D. Rivest-Hénault, École de Technologie Supérieure (Canada); J. Miró, C. Lapierre, Cfr. Hospitalier Univ. Sainte-Justine (Canada); L. Duong, M. Cheriet, École de Technologie Supérieure (Canada)

POSTER SESSION: ACQUISITION TECHNOLOGIES

Single wall closed-form differential ultrasound calibration [8316-81]
M. Najafi, N. Afsham, P. Abolmaesumi, R. Rohling, The Univ. of British Columbia (Canada)

Characterization of tissue-simulating phantom materials for ultrasound-guided needle procedures [8316-82]
S. Buchanan, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); J. Moore, D. Lammers, J. Baxter, Robarts Research Institute (Canada); T. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)

Localization of liver tumors in freehand 3D laparoscopic ultrasound [8316-83]
O. Shahin, V. Martens, Univ. of Lübeck (Germany); A. Beširević, M. Kleemann, Univ. Hospital Schleswig-Holstein (Germany); A. Schlaefer, Univ. of Lübeck (Germany)

Real-time registration of video with ultrasound using stereo disparity [8316-84]
J. Wang, S. Horvath, Carnegie Mellon Univ. (United States); G. Steffen, Carnegie Mellon Univ. (United States) and Univ. of Pittsburgh (United States); M. Siegel, J. Galeotti, Carnegie Mellon Univ. (United States)
**8316 2E** Bent rigid endoscopes: a challenge for accurate distortion correction and 3D reconstruction [8316-85]
L. A. Kahrs, R. F. Labadie, Vanderbilt Univ. Medical Ctr. (United States)

**8316 2F** Validation of an algorithm for planar surgical resection reconstruction [8316-86]
F. E. Milano, Univ. de Buenos Aires (Argentina) and Hospital Italiano de Buenos Aires (Argentina); L. E. Ritacco, G. L. Farfalli, L. A. Aponte-Tinao, F. González Bernaldo de Quirós, Hospital Italiano de Buenos Aires (Argentina); M. Risk, Instituto Tecnológico de Buenos Aires (Argentina) and Consejo Nacional de Investigaciones Científicas y Tecnicas (Argentina)

**8316 2G** Two new ad-hoc models of detection physics and their evaluation for navigated beta probe surface imaging [8316-88]
D. I. Shakir, A. Hartl, F. R. Schneider, J. Pulko, S. I. Ziegler, N. Navab, T. Lasser, Technische Univ. München (Germany)

**8316 2H** Freehand SPECT reconstructions using look up tables [8316-89]
A. Hartl, D. I. Shakir, R. Kojchev, N. Navab, S. I. Ziegler, T. Lasser, Technische Univ. München (Germany)

**POSTER SESSION: TECHNOLOGY EVALUATION**

**8316 2I** Lightweight distributed computing for intraoperative real-time image guidance [8316-90]
S. Suwelack, D. Katic, S. Wagner, P. Spengler, S. Bodenstedt, S. Röhl, R. Dillmann, S. Speidel, Karlsruhe Institute of Technology (Germany)

**8316 2J** Simplified development of image-guided therapy software with MITK-IGT [8316-91]
A. M. Franz, A. Seiten, German Cancer Research Ctr. (Germany); M. Servatius, Univ. of Heidelberg (Germany); C. Zöllner, I. Gergel, I. Wegner, J. Neuhaus, S. Zelzer, M. Nolden, J. Gaa, P. Mercea, K. Yung, German Cancer Research Ctr. (Germany); C. M. Sommer, B. A. Radeleff, Univ. of Heidelberg (Germany); H.-P. Schiemer, German Cancer Research Ctr. (Germany); H.-U. Kauczor, Univ. of Heidelberg (Germany); H.-P. Meinzer, L. Maier-Hein, German Cancer Research Ctr. (Germany)

**8316 2K** Simulation, design, and analysis for magnetic anchoring and guidance of instruments for minimally invasive surgery [8316-92]
H. Luo, Children's National Medical Ctr. (United States) and Tianjin Univ. (China); E. Wilson, K. Cleary, Children's National Medical Ctr. (United States)

**8316 2L** A robust motion estimation system for minimal invasive laparoscopy [8316-93]
J. M. Marcinczak, U. von Öhse, R.-R. Grigat, Technische Univ. Hamburg-Harburg (Germany)

**POSTER SESSION: PROSTATE**

**8316 2M** Imaging of prostate cancer: a platform for 3D co-registration of in-vivo MRI ex-vivo MRI and pathology [8316-95]
C. Orczyk, Univ. Hospital of Caen (France) and New York Univ. Medical Ctr. (United States); A. Mikheev, A. Rosenkrantz, J. Melamed, S. S. Taneja, H. Rusinek, New York Univ. Medical Ctr. (United States)
Intra-operative prostate motion tracking using surface markers for robot-assisted laparoscopic radical prostatectomy [8316-96]
M. Esteghamatian, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); K. Sarkar, The Univ. of Western Ontario (Canada); S. E. Pautler, The Univ. of Western Ontario (Canada) and Canadian Surgical Technologies and Advanced Robotics London (Canada); E. C. S. Chen, Robarts Research Institute (Canada); T. M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)

3D prostate segmentation of ultrasound images combining longitudinal image registration and machine learning [8316-97]
X. Yang, Emory Univ. (United States); B. Fei, Emory Univ. (United States) and Georgia Institute of Technology (United States)

POSTER SESSION: CARDIAC AND VASCULAR

Calibration and evaluation of a magnetically tracked ICE probe for guidance of left atrial ablation therapy [8316-98]
C. A. Linte, M. E. Reitmann, Mayo Clinic (United States); B. Dilger, The Univ. of Iowa (United States); M. S. Gunawan, Georgetown Univ. Medical Ctr. (United States); S. P. Arunachalam, D. R. Holmes III, D. L. Packer, R. A. Robb, Mayo Clinic (United States)

Evaluation of mitral valve replacement anchoring in a phantom [8316-99]
A. J. McLeod, J. Moore, P. Lang, D. Bainbridge, The Univ. of Western Ontario (Canada); G. Campbell, The Univ. of Western Ontario (Canada) and National Research Council of Canada (Canada); D. L. Jones, G. M. Guiraudon, T. M. Peters, The Univ. of Western Ontario (Canada)

Cryo-balloon catheter position planning using AFIT [8316-100]
A. Kleinoeder, A. Brost, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); F. Bourier, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany); M. Koch, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); K. Kurzdímis, Klinik fur Herzrhythmusstorungen, Krankenhaus Barmherzige Bruder (Germany); J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and School in Advanced Optical Technologies (Germany); N. Strobel, Siemens AG (Germany)

Simulation based patient-specific optimal catheter selection for right coronary angiography [8316-101]
S. Rahman, C. Thoene, S. Wesarg, Technische Univ. Darmstadt (Germany); W. Voelker, Universitaetsklinikum Wuerzburg (Germany)

Automatic contour and centerline extractions of single and bifurcated vessels in coronary angiogram [8316-102]
J. Baek, H. Hong, Seoul Women’s Univ. (Korea, Republic of)

Robust tracking of a virtual electrode on a coronary sinus catheter for atrial fibrillation ablation procedures [8316-103]
W. Wu, T. Chen, Siemens Corporate Research (United States); N. Strobel, Siemens AG (Germany); D. Comaniciu, Siemens Corporate Research (United States)
8316 2V Real-time circumferential mapping catheter tracking for motion compensation in atrial fibrillation ablation procedures [8316-104]
A. Brost, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); F. Bourier, Klinik für Herzrhythmusstörungen, Krankenhaus Barmherzige Bruder (Germany); A. Wimmer, M. Koch, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); A. Kiraly, R. Liao, Siemens Corporate Research (United States); K. Kurzidim, Klinik für Herzrhythmusstörungen, Krankenhaus Barmherzige Bruder (Germany); J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and School in Advanced Optical Technologies (Germany); N. Strobel, Siemens AG (Germany)

8316 2W Enhanced segmentation and skeletonization for endovascular surgical planning [8316-105]
I. Cheng, Univ. of Alberta (Canada) and Institut National des Sciences Appliquées (France); A. Firouzmanesh, Univ. of Alberta (Canada); A. Leleve, Institut National des Sciences Appliquées (France); R. Shen, Univ. of Alberta (Canada); R. Moreau, V. Brizzi, M.-T. Pham, T. Redarce, P. Lermusiaux, Institut National des Sciences Appliquées (France); A. Basu, Univ. of Alberta (Canada)

8316 2X Feature identification for image-guided transcatheter aortic valve implantation (Cum Laude Poster Award) [8316-106]
P. Lang, M. Rajchl, A. J. McLeod, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); M. W. Chu, The Univ. of Western Ontario (Canada); T. M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)

8316 2Y Towards image-guided atrial septal defect repair: an ex vivo analysis [8316-107]
D. M. Kwartowitz, Clemson Univ. (United States) and Medical Univ. of South Carolina (United States); F. N. Mefleh, Medical Univ. of South Carolina (United States); G. H. Baker, Clemson Univ. (United States) and Medical Univ. of South Carolina (United States)

POSTER SESSION: NEURO AND HEAD

8316 2Z Optimizing the delivery of deep brain stimulation using electrophysiological atlases and an inverse modeling approach [8316-108]
K. Sun, S. Pallavaram, W. Rodriguez, P.-F. D’Haese, B. M. Dawant, M. I. Miga, Vanderbilt Univ. (United States)

8316 30 Visualizing the path of blood flow in static vessel images for image guided surgery of cerebral arteriovenous malformations [8316-109]
S. J.-S. Chen, M. Kersten-Oertel, S. Drouin, D. L. Collins, McGill Univ. (Canada)

8316 31 Intraoperative brain tumor resection cavity characterization with conoscopic holography [8316-110]
A. L. Simpson, J. Burgner, I. Chen, T. S. Pheiffer, K. Sun, R. C. Thompson, R. J. Webster III, M. I. Miga, Vanderbilt Univ. (United States)

8316 32 Analysis of electrodes’ placement and deformation in deep brain stimulation from medical images [8316-111]
M. Mehri, F. Lalys, C. Maumet, INSERM (France) and IRISA, CNRS, Univ. de Rennes 1 (France); C. Haegelen, INSERM (France), IRISA, CNRS, Univ. de Rennes 1 (France), and Pontchaillou Univ. Hospital (France); P. Jannin, INSERM (France) and IRISA, CNRS, Univ. de Rennes 1 (France)
A clinical pilot study of a modular video-CT augmentation system for image-guided skull base surgery [8316-112]
W. P. Liu, D. J. Mirotta, A. Uneri, Y. Otake, G. Hager, The Johns Hopkins Univ. (United States); D. D. Reh, M. Ishii, G. L. Gallia, The Johns Hopkins Medical Institute (United States); J. H. Siewerdsen, The Johns Hopkins Univ. (United States)

Quantifying cortical surface harmonic deformation with stereovision during open cranial neurosurgery [8316-113]
S. Ji, X. Fan, Dartmouth College (United States); D. W. Roberts, Dartmouth Hitchcock Medical Ctr. (United States); K. D. Paulsen, Dartmouth College (United States) and Dartmouth Hitchcock Medical Ctr. (United States)

POSTER SESSION: LUNG AND ABDOMEN

Automated microwave ablation therapy planning with single and multiple entry points [8316-114]
S. X. Liu, S. Dalal, J. Kruecker, Philips Research North America (United States)

Optimization of CT-video registration for image-guided bronchoscopy [8316-115]
R. Khare, W. E. Higgins, The Pennsylvania State Univ. (United States)

Automatic segmentation and centroid detection of skin sensors for lung interventions [8316-116]
K. Lu, Philips Research North America (United States); S. Xu, National Institutes of Health (United States); Z. Xue, S. T. Wong, Methodist Hospital Research Institute (United States)

Image processing of liver computed tomography angiographic (CTA) images for laser induced thermotherapy (LITT) planning [8316-117]
Y. Li, The Johns Hopkins Univ. (United States); X. Gao, Q. Tang, S. Gao, Tsinghua Univ. (China)

Tumor image extraction from fluoroscopy for a markerless lung tumor motion tracking and prediction [8316-118]
N. Homma, K. Ishihara, Tohoku Univ. (Japan); Y. Takai, Hirosaki Univ. Graduate School of Medicine (Japan); H. Endo, St. Luke's International Hospital (Japan); K. Ichiji, M. Sakai, Tohoku Univ. (Japan); Y. Narita, Hirosaki Univ. Graduate School of Medicine (Japan); M. Abe, N. Sugita, M. Yoshizawa, Tohoku Univ. (Japan)

Real-time motion compensation for EM bronchoscope tracking with smooth output - ex-vivo validation [8316-119]
T. Reichl, Technische Univ. München (Germany); I. Gergel, German Cancer Research Ctr. (Germany); M. Menzel, H. Hautmann, Klinikum rechts der Isar (Germany); I. Wegner, H.-P. Meinzer, German Cancer Research Ctr. (Germany); N. Navab, Technische Univ. München (Germany)

Combining supine MRI and 3D optical scanning for improved surgical planning of breast conserving surgeries [8316-120]
M. J. Pallone, Dartmouth College (United States); S. P. Poplack, R. J. Barth, Jr., Dartmouth Hitchcock Medical Ctr. (United States); K. D. Paulsen, Dartmouth College (United States)
A novel external bronchoscope tracking model beyond electromagnetic localizers: dynamic phantom validation [8316-121]
X. Luo, Nagoya Univ. (Japan); T. Kitasaka, Aichi Institute of Technology (Japan); K. Mori, Nagoya Univ. (Japan)

Utilizing ultrasound as a surface digitization tool in image guided liver surgery [8316-122]
K. E. Miller, J. E. Ondrake, T. S. Pheiffer, A. L. Simpson, Vanderbilt Univ. (United States); M. I. Miga, Vanderbilt Univ. (United States) and Vanderbilt Univ. Medical Ctr. (United States)

Automatic alignment of pre- and post-interventional liver CT images for assessment of radiofrequency ablation [8316-123]
C. Rieder, S. Wirtz, J. Strehlow, S. Zidowitz, Fraunhofer MEVIS (Germany); P. Bruners, P. Isfort, A. H. Mahnken, RWTH Aachen Univ. Hospital (Germany); H.-O. Peitgen, Fraunhofer MEVIS (Germany)

Author Index
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Nico Karssemeijer, Radboud University Nijmegen Medical Center (Netherlands)

Conference Chairs

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1 Visualization, Segmentation, and Registration
   Jayaram K. Udupa, The University of Pennsylvania Health System (United States)
   Pierre Jannin, Université de Rennes 1 (France)

2 Tracking and Radiation Therapy
   Gabor Fichtinger, Queen’s University (Canada)
   Jay B. West, Accuray, Inc. (United States)

3 Keynote and Robotics
   David R. Holmes III, Mayo Clinic (United States)
   David M. Kwartowitz, Clemson University (United States)

4 Simulation and Modeling
   Michael Miga, Vanderbilt University (United States)
   Frank Sauer, Siemens Corporate Research (United States)

5 2D/3D and Fluoroscopy
   Jay B. West, Accuray, Inc. (United States)
   Wolfgang Birkfellner, Medizinische Universität Wien (Austria)

6 Keynote and Ultrasound
   Kenneth H. Wong, Virginia Polytechnic Institute and State University (United States)
   Marvin M. Doyley, University of Rochester (United States)

7 Optical, Laparoscopic, and Needle Techniques
   William E. Higgins, The Pennsylvania State University (United States)
   Eric J. Seibel, University of Washington (United States)

8 Prostate
   Purang Abolmaesumi, The University of British Columbia (Canada)
   Guy Shechter, Philips Medical Systems (United States)

9 Cardiac and Vascular
   Terry Peters, Robarts Research Institute (Canada)
   Baowei Fei, Emory University (United States)

10 Neuro and Head
   Robert J. Webster III, Vanderbilt University (United States)
   David R. Haynor, University of Washington (United States)

11 Lung and Liver
   Ziv R. Yaniv, Children’s National Medical Center (United States)
   Steven L. Hartmann, Medtronic Navigation (United States)
Introduction

Welcome to the 2012 edition of the SPIE Image-Guided Procedures, Robotic Interventions, and Modeling conference proceedings. This year, we changed the title of the conference to emphasize the growing importance of robotics. The conference continues to be a premier venue for our field, small enough to be highly collegial yet still showcasing the latest technical advances. The conference is an ideal setting for students to gain an understanding of the research community and interact with both peers and mentors. This year we received approximately 140 abstract submissions and accepted approximately 120. The number and quality of submissions has remained strong despite many changes in the research and funding environment, which is very encouraging for our field.

Reflecting the new emphasis area of robotics, our conference was fortunate this year to welcome Dr. Russ Taylor of Johns Hopkins University as our keynote speaker. Dr. Taylor's presentation was a grand tour through the use of robotics in medical applications, emphasizing the capacity of tools both simple and complex to enhance and extend the physician's individual capabilities. Yet his talk was also a bold look to a future vision where the entire operating suite is considered as a unified system. Within that vision, pervasive data collection throughout the operating “process” can be used for continual optimization, similar to what is done in traditional industrial and systems engineering.

This year we continued the tradition of holding a combined session with the Ultrasonic Imaging, Tomography, and Therapy conference. There are numerous scientific areas where our two conferences overlap, and thus the joint session is an excellent opportunity for the two groups to learn from each other and from the keynote speaker. Dr. Keith Paulsen of Dartmouth Medical School gave the Ultrasonics keynote, and discussed the many developments in 3D ultrasound and how they have benefited modern neurosurgery by enabling more robust registrations and improved intraoperative image updates.

This year we bade farewell to three of our “retiring” committee members: Jay Udupa, Bob Galloway, and Kevin Cleary. These three have given many dedicated years of service to growing this conference and have been great mentors to those of us who are new to the committee. We are truly grateful to all our committee members for their help in reviewing abstracts, evaluating student papers, and judging posters. We can always rely on their speedy and conscientious advice. Their steadfast dedication to the work of the committee makes our job much more pleasant.
It would be impossible to run this conference without the outstanding support of the SPIE staff members, including the office staff, management, and editors. They make our job easier, ensure that deadlines are met, and allow us to focus on the technical content. Particular thanks go to Sandy Hoelterhoff and Diane Cline for always being on top of every detail.

Finally, we would like to thank all the attendees who come to give talks, present posters, and actively participate in the meeting. We look forward to seeing you next year in Orlando and for many years to come!

David R. Holmes III
Kenneth H. Wong
Fortieth Anniversary of SPIE Medical Imaging Meeting

Robert M. Nishikawa*  
Carl J. Vyborny Translation Laboratory for Breast Imaging Research  
Department of Radiology, and the Committee on Medical Physics, The University of Chicago, 5841 S. Maryland Ave. MC-2026, Chicago, IL 60637

This meeting marked the 40th year from the first SPIE Medical Imaging meeting. This paper presents a brief summary of the 40-year history of the meeting, with an emphasis on the Physics Conference. That is, when the meeting split into multiple conferences, data are presented mostly for the Physics conference only.

The first conference was held in 1972 in Chicago and it was called: *Application of Optical Instrumentation in Medicine.*

"We have endeavored, by way of the seminar, to provide a communication link between those with expertise in the various technologies associated with image forming devices and those in the medical field who rely on the fruits of these technologies for many of their diagnostic tools...there is a genuine interest among those in the medical field for a better understanding of the fundamental technology of imaging systems."  
William C. Zarnstroff, General Chairman

For the next 40 years, with the exception of 1978 the meeting was held annually.

The first 13 conferences were entitled: *Application of Optical Instrumentation in Medicine*, appended with a roman numeral. The 14th meeting (1986) was modified to recognize the growing importance of PACS to the meeting: *Application of Optical Instrumentation in Medicine XIV and Picture Archiving and Communication Systems (PACS IV) for Medical Applications*. The following year, the conference name changed to “Medical Imaging” as it is known today, although the first 6 were denoted by roman numerals. Starting in 1993, the year was appended to the title.

The meeting started as a single track, two-day conference, and now has 8 distinct conferences covering five days plus an additional day of courses.

In 1988, the proceedings were published in two volumes, 914A and 914B. The former covering physics, image processing, and perception and the latter display and PACS. The following year (1989) each of those two split in two so that there were now four conferences:

1. *Medical Imaging III: Image Formation*
2. *Medical Imaging III: Image Capture and Display*
3. *Medical Imaging III: Image Processing*
4. *Medical Imaging III: PACS System Design and Evaluation*

These sessions were partially overlapping and, thus, for the first time, the meeting had parallel session.

This configuration of conferences remained until 1994 when Image Perception and Physiology and Function from Multidimensional Images were added. In 1997, Ultrasonic Transducer Engineering was added. In 2007, Computer-Aided Diagnosis was added.

From 1976 to 1983, the meeting was held in conjunction with or preceding the American Roentgen Ray Society. As a result, the location of the meeting changed annually. Starting in 1985, the meeting was held in Newport Beach, CA, and this was home for the next 10 years, except in 1991, the meeting was held in San Jose in conjunction with the Electronic Imaging meeting. In 1995, the meeting was then moved to San Diego, and then returned once more to Newport Beach, before moving to San Diego till 2009. Since 2009 the meeting has been alternating between San Diego and Lake Buena Vista, FL.

In the Introduction to the proceedings in 1984, Chairman Roger Schneider wrote:

*This meeting, the twelfth in the series ... was intended to be a change in direction from recent meetings in the series, a reversion to the attack on fundamental problems in imaging which earlier meetings represented. We also desired to bring onto the floor a recognition that the scientific interest in imaging*

* r-nishikawa@uchicago.edu| phone: 1-773-702-9047
is more broad and active now than it was a decade ago and that substantial progress has been made in formulating at least the structure of an understanding of the conveyance of information to human observers through imaging channels. ... We recognized the current intense interest in development of medical systems based upon the most contemporary image communication and storage technologies, and included that topic. The design goal was to address the physics and statistics of image encoding by modality; and the processing, display, archiving, management, and psychophysical considerations independently of modality, as far as possible.

It took 2 years for this new emphasis to flourish. Beginning in 1986, the attendance and the number of papers increased rapidly (as can be seen in the plots below).

Finally, it is important to note that every year for the past 40 years, the Center for Devices and Radiological Health, FDA (formerly, the Bureau for Radiological Health) has been a cosponsor or supporting organization. Further, many members of the CDRH/BRH have helped organize the meeting, such as Robert Wagner, Robert Jennings, Roger Schneider, David Brown and several others. Their contributions to this meeting mirror the impact that the CDRH/BRH have had on the field.

![Plot of attendance and number of papers over time](image1.png)

**Figure 1.** These plots capture some of the statistics from the meeting over time.

### 1.1 Fun Facts

Bob Wagner dubbed 1984-1987, the Palindrome Years.

The first digital mammography paper and the first dual-energy mammography paper were presented in 1983.

The first computer-aided diagnosis (CAD) paper was presented in 1985.

The first Proceedings (Vol. 35) had a black cover and was hard bound. All subsequent Proceedings had a yellow cover and were soft bound.

The first posters were in 1988. Each poster had 3 full poster boards and wine was served at the poster session.
Although there was no “Medical Imaging” meeting in 1978, there was another medical imaging themed conferences: Recent and Future Developments in Medical Imaging I; edited by Norman A. Baily.

In 2001, the proceedings were distributed on CD for the first time.

Table 1. Number of years serving as a Conference Chair (includes all Conferences) or serving on the Physics Committee (including being Chair). Years on Physics Committee includes committee membership when there was only a single conference and only the Physics Committee when there were multiple conferences.

<table>
<thead>
<tr>
<th>Years Served as a Conference Chair</th>
<th>Years Served on Physics Committee</th>
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<tbody>
<tr>
<td>Samuel J. Dwyer III 13</td>
<td>Robert F. Wagner 19</td>
</tr>
<tr>
<td>Roger H. Schneider 12</td>
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<td>Thomas G. Flohr 7</td>
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1.2 Summary of Each Meeting

Following is a brief summary of each meeting from 1972-2012. When there were multiple conferences at the meeting, the summary focuses mainly on the Physics Conference. I also have most of this information in an excel spreadsheet. It is available from the author to those who would like it.
## Overview of the 40-Year History of the SPIE Medical Imaging Meeting

### 1972

**Application of Optical Instrumentation in Medicine**  
(In-depth-Seminar)  
Chicago Nov 29-30  
Vol. 35 29 papers Attendance: n/a  
Sponsors, Co-Sponsors & Supporting Organizations  
SPIE; BRH; ASNR; SMM; UWMS; AAPM  
Chairs  
William C. Zarnstorff, William R. Hendee, Paul L. Carson  
Program Committee  
Not listed  
Sessions  
Electro-Optical Instrumentation - William R. Hendee  
Image Analysis, Enhancement and Evaluation - Paul L. Carson  
Holographic and Video Images - William R. Hendee  
Special Topics - William C. Zarnstorff  
Panel Discussion - Jack S. Krohmer

### 1973

**Application of Optical Instrumentation in Medicine II**  
Chicago Nov 29-30  
Vol. 43 35 papers Attendance: n/a  
Sponsors, Co-Sponsors & Supporting Organizations  
SPIE; AAPM; ASNR; AAMI; BRH EMBG; OSA; SMM; SRE; SPSE;  
Chairs  
William R. Hendee, William C. Zarnstorff, Paul L. Carson  
Program Committee  
Not listed  
Sessions  
Nuclear Medicine Imaging  
Image Enhancement and Pattern Recognition  
Panel Discussion: Image Enhancement for Medical Diagnosis Can It Be Effective?  
Special Topics  
Image Intensifier Systems  
Transmission, Storage, Retrieval and Reconstruction of Images  
Panel Discussion: Performance Standards and Possible Field Evaluation of Image Intensifiers

### 1974

**Application of Optical Instrumentation in Medicine III**  
Kansas City, MO Aug 1-2  
Vol. 47 45 papers Attendance: n/a  
Sponsors, Co-Sponsors & Supporting Organizations  
SPIE; BRH; AAPM, ARRS; EMBG  
Chairs  
Paul L. Carson, Edward L. Chaney, William R. Hendee  
Program Committee  
Not listed  
Sessions  
Transmission 3-Dimensional Image Reconstruction and Computerized Axial Tomography - William R. Hendee, Joseph Gallagher  
Advanced Techniques of Imaging With Ultrasound - Paul L. Carson  
Acoustic Exposure Determination In Diagnostic Ultrasound - James A. Rooney  
Non, Objective, and Psychophysical Measures - Joel E. Gray  
Special Topics - Jacques Ovadia  
Ray Tube Focal Spot Size and Intensity Distributions: Important Practical Considerations - Brent E. Bjergard  
Automatic Brightness Control In Image-Intensified Fluoroscopy - William R. Hendee

### 1975

**Application of Optical Instrumentation in Medicine IV**  
Atlanta, GA Sept. 25-27  
Vol. 70 55 papers Attendance: n/a  
Sponsors, Co-Sponsors & Supporting Organizations  
SPIE; BRH; AAPM, ARRS, ACR, SRE  
Chairs  
Joel E. Gray, William R. Hendee  
Program Committee  
Not listed  
Sessions  
Quality Assurance, Film Handling & Film Processing - Joel E. Gray  
Loading, Heat Rating, Other Characteristics of X-Ray Tubes - Edward L. Chaney  
Information Extraction & Utilization From Radiologic Images - Marvin E. Haskin  
Quality Assurance In Diagnostic Radiology: Why Doesn't Every Department Have A Complete Program? Panel Discussion -  
Quality Assurance for Diagnostic Radiologic Instrumentation - James J. Vucich  
Exposure Initiation/Termination Mechanisms and Automatic Exposure Timers In Diagnostic Radiology - Robert G. Waggener  
Rare Earth Intensifying Screens - E. Dale Trout  
Panel Discussion: Performance Specifications for Diagnostic Radiologic Equipment -  
Gray-Scale Ultrasound Imaging & Tissue Identification - Paul L. Carson  
Physical Evaluation of Computerized Axial Tomography - Raymond P. Rossi  
Special Topics - Robert Rohrer  
Panel Discussion: Performance Evaluation of Mammographic Imaging Systems - Gregory L. Dubaque
1976
Application of Optical Instrumentation in Medicine V
Washington, DC Sept. 16-19
Vol. 96 76 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; ARRS; SRE
Chairs
Program Committee
Same as Editors
Sessions
Quality Assurance in Diagnostic Radiology I - Raymond P. Rossi
Quality Assurance in Diagnostic Radiology II - Thomas Stone
Computed Tomography I - Norman A. Baily
Radiographic Images and Dose - Arthur G. Haus
Computed Tomography II - Rodney A. Brooks
Computed Tomography III - Kenneth Weaver
Diagnostic Ultrasound I - Paul L. Canon
Quality Assurance in Diagnostic Radiology III - Robert K. Carak
Current Topics in Mammography - Gregory Dubuque

1977
Application of Optical Instrumentation in Medicine VI
Bryn Mawr, PA Sept. 25-27
Vol. 127 90 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; BRH; ARRS; SRE
Chairs
Joel E. Gray, William R. Hendee
Program Committee
Robert F. Wagner, William Properzio, Arthur G. Haus, Joe Pierce Jones, Raymond Rossi
Sessions
The Laboratory/Clinical Interface in Image Evaluation - Robert Wagner
Sensitometry Update - Joel Gray
Screen Film Systems and Photosensitive Materials - Arthur G. Haus
Approaches to Equipment Service, Equipment Specification and Performance Evaluation - Raymond P. Rossi
New Developments in Medical Imaging - William Hendee
Quality Control in Medical Imaging - William S. Properzio
Performance Characteristics of CT Scanners - Robert K. Carak
Small Group Sessions on Special Topics - Joint Session with ARRS

1978
No Meeting

1979
Application of Optical Instrumentation in Medicine VII
Toronto, Canada Mar. 25-27
Vol. 173 55 papers Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; SPSE; ARRS; BRH; SRE
Chairs
Joel E. Gray
Program Committee
Sessions
Imaging Systems: Physical Evaluation - Joel Gray
Imaging Systems: Perception Evaluation - Joel Gray
Imaging Systems: Special Topics - Arthur Haus
Mammography - William Properzio
Special Topics - Raymond Rossi
Computed Tomography: Practical Considerations - William R. Hendee
Computed Tomography: Theoretical Considerations - William R. Hendee
X-Ray Imaging Research in Toronto - K. W. Taylor
Joint Session with the ARRS - Joel Gray; William R. Hendee; Harry Z. Mellins
1980
Application of Optical Instrumentation in Medicine VIII
Las Vegas, NV  Apr 20-22
Vol. 233  43 papers  Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; SPSE; ARRS; BRH; SRE
Chairs
Joel Gray, Arthur G. Haus, William R. Hendee, William S. Properzio
Program Committee
Same as Editors
Sessions
Screen-Film Evaluation - Arthur G. Haus
Unconventional Imaging Techniques - Joel Gray
New Concepts in Conventional Imaging Techniques - James A. Mulvaney
How Might Exposure Values Be Determined for Radiological Exams? - William S. Properzio
Joint Session with the ARRS - Joel Gray; Joseph Cahn

1981
Application of Optical Instrumentation in Medicine IX
San Francisco, CA  Mar 22-24
Vol. 273  51 papers  Attendance: n/a
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; SPSE; AAPM; ARRS; BRH; SRE
Chairs
Joel E. Gray, Arthur G. Haus, William S. Properzio, James A. Mulvaney
Program Committee
Same as Editors
Sessions
Special Session: Nuclear Magnetic Resonance Imaging: Current Status - Leon Partain; A. Everette James, Jr.
Conventional Imaging Systems Evaluation - Arthur G. Haus
Digital Radiography - William S. Properzio
Quality Control - James A. Mulvaney
Nuclear Medicine - Joel E. Gray
Break-Out Session A: Nuclear Magnetic Resonance Imaging: C. Leon Partain
Break-Out Session B: Computed Tomography - Gary D. Fullerton
Break-Out Session C: Digital Imaging - William S. Properzio
Break-Out Session D: Conventional Imaging Systems Evaluation - Joel E. Gray
Joint Session with the ARRS - Arthur G. Haus; James F. Martin
Computerized Tomography - Gary D. Fullerton
Recording, Storage, and Processing of Images - Joel E. Gray

1982
Application of Optical Instrumentation in Medicine X
New Orleans  May 9-12
Vol. 347  58 papers  Attendance: 300
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; ARRS; AAPM; BRH; SPSE; SRE
Chairs
Gary D. Fullerton, Arthur G. Haus, William S. Properzio, James A. Mulvaney
Program Committee
Same as Editors
Sessions
Special Session on Digital Radiography - Benjamin A. Arnold; Andrew B. Cramby
Conventional Imaging Systems Evaluation - Arthur G. Haus
Digital Radiography - William S. Properzio
Computed Tomography - James A. Mulvaney
Conventional Imaging Systems Evaluation - Charles A. Kelsey
Break-Out Session A: Digital Radiography - William S. Properzio
Break-Out Session B: Conventional Imaging - James A. Mulvaney
Break-Out Session C: Nuclear Magnetic Resonance Imaging - Gary D. Fullerton
Joint Session with the ARRS - John Tampas; Gary D. Fullerton
Digital Radiography (Cosponsored by The ARRS and SPIE) - M. Paul Capp; William R. Hendee
Nuclear Magnetic Resonance Imaging (NMRI) (Cosponsored by ARRS and SPIE) - A. Everette James, Raymond L. Nunnally
Integrated Systems for Analysis and Display of Radiological Images - Michael J. Flynn
Nuclear Magnetic Resonance (NMRI) (Cosponsored by ARRS and SPIE) - A. Everette James, Raymond L. Nunnally

1983
Application of Optical Instrumentation in Medicine XI
Atlanta  Apr 17-20
Vol. 419  41 papers  Attendance: 296
Sponsors, Co-Sponsors & Supporting Organizations
SPIE; ARRS; AAPM; BRH SPSE; SRE
Chairs
Gary D. Fullerton
Program Committee
Arthur G. Haus, James A. Mulvaney, William Properzio
Sessions
Advances in Breast Imaging - Roger S. Powell
Conventional Imaging Systems Evaluation - Arthur G. Haus
Digital Radiography I - James A. Mulvaney
Image Performance Evaluation and Quality Assurance - William S. Properzio
Digital Radiography II - Stewart C. Bushong
Break-Out Session A: Nuclear Magnetic Resonance Imaging - Gary D. Fullerton
Break-Out Session B: Digital Radiography - William S. Properzio
Break-Out Session C: Conventional Imaging - James A. Mulvaney
Joint Session with SPIE and The ARRS - Melvin M. Figley; Gary D. Fullerton
Nuclear Magnetic Resonance Imaging - Gary D. Fullerton
New Modalities and Computers in Medical Imaging - Michael J. Flynn

xxviii
### 1996
**Medical Imaging 1996: Physics of Medical Imaging**
Newport Beach, CA 11-13 February
Vol. 2708 362 papers (79 in Physics) Attendance: 866

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RISC; RSNA; SCAR

**Chairs**
Richard L. Van Metter, Jacob Beutel

**Program Committee**
Larry E. Antonuk; Gary T. Barnes; John M. Boone; Randall P. Brown; Ian A. Cunningham; Frank A. DiBianca; James T. Dobbins III; Robert J. Endorf; Hans Roehrig; Robert F. Wagner; Martin J. Yaffe; Herbert D. Zeman

**Sessions**
- Plenary Session - Robert Wagner
  - New Concepts in Information Theory - Hans Roehrig
  - Image Quality and X-Ray Physics I - John M. Boone
  - Image Quality and X-Ray Physics II - John M. Boone
  - Image Quality and X-Ray Physics III - Robert J. Endorf
  - Mammographic Imaging - Martin J. Yaffe
  - Ultrasound - Herbert D. Zeman
  - Volume Imaging I - Frank A. DiBianca
  - Volume Imaging II - Frank A. DiBianca
  - Detectors for Digital Radiography I - Larry E. Antonuk
  - Detectors for Digital Radiography II - James T. Dobbins III

**Other Conferences**

<table>
<thead>
<tr>
<th>Vol #</th>
<th>Title</th>
<th>Editor/Conference Chair</th>
<th># of papers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2707</td>
<td>Image Display</td>
<td>Yongmin Kim</td>
<td>65</td>
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<tr>
<td>2709</td>
<td>Physiology and Function from Multidimensional Images</td>
<td>Eric A. Hoffman</td>
<td>46</td>
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<tr>
<td>2710</td>
<td>Image Processing</td>
<td>Murray Loew, Kenneth Hanson</td>
<td>60</td>
</tr>
<tr>
<td>2711</td>
<td>PACS Design and Evaluation: Engineering and Clinical Issues</td>
<td>Dwyer III</td>
<td>123</td>
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<tr>
<td>2712</td>
<td>Image Perception</td>
<td>Harold L. Kundel</td>
<td>25</td>
</tr>
</tbody>
</table>

### 1997
**Medical Imaging 1997: Physics of Medical Imaging**
San Jose, CA Feb 23-25
Vol. 3032 451 papers (57 in Physics) Attendance: 1021

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RISC; RSNA; SCAR

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Larry E. Antonuk; Gary T. Barnes; John M. Boone; Ian A. Cunningham; Frank A. DiBianca; James T. Dobbins III; Robert J. Endorf; Gary S. Keyes; Hans Roehrig; Robert F. Wagner; Martin J. Yaffe; Herbert D. Zeman

**Sessions**
- Image Acquisition I - John M. Boone
  - Image Acquisition II - Frank A. DiBianca
  - Image Physics I - Robert F. Wagner
  - Imaging Physics II - Hans Roehrig
  - Volume Imaging I - Herbert D. Zeman
  - Volume Imaging II - Robert J. Endorf
  - Mammographic Imaging - Martin J. Yaffe
  - Film/Screen and CR Imaging - Ian A. Cunningham

**Other Conferences**

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<thead>
<tr>
<th>Vol #</th>
<th>Title</th>
<th>Editor/Conference Chair</th>
<th># of papers</th>
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<tr>
<td>3031</td>
<td>Image Display</td>
<td>Yongmin Kim</td>
<td>123</td>
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<tr>
<td>3033</td>
<td>Image Display and Function from Multidimensional Images</td>
<td>Eric A. Hoffman</td>
<td>25</td>
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<tr>
<td>3034</td>
<td>Image Processing</td>
<td>Kenneth M. Hanson</td>
<td>35</td>
</tr>
<tr>
<td>3035</td>
<td>PACS Design and Evaluation: Engineering and Clinical Issues</td>
<td>Blaine</td>
<td>60</td>
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<td>3036</td>
<td>Image Perception</td>
<td>Harold L. Kundel</td>
<td>25</td>
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<tr>
<td>3037</td>
<td>Ultrasonic Transducer Engineering</td>
<td>K. Kirk Shung</td>
<td>25</td>
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### 1998
**Medical Imaging 1998: Physics of Medical Imaging**
San Diego, CA Feb 22-24
Vol. 3336 454 papers (66 in Physics) Attendance: 1153

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RISC; RSNA; SCAR

**Chairs**
James T. Dobbins III, John M. Boone

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**Sessions**
- X-Ray Detectors I - Richard L. Van Metter
  - X-Ray Physics - Gary S. Keyes
  - X-Ray Imaging: In-Line Imaging - Robert J. Endorf
  - X-Ray Detectors II - Martin J. Yaffe
  - Mammographic Imaging - John M. Boone
  - Imaging Theory - Robert F. Wagner
  - Volume Imaging I - Ian A. Cunningham
  - Imaging Physics - Hans Roehrig
  - Real-Time X-Ray Detectors - Frank A. DiBianca
  - X-Ray Detectors III - James T. Dobbins III

**Other Conferences**

<table>
<thead>
<tr>
<th>Vol #</th>
<th>Title</th>
<th>Editor/Conference Chair</th>
<th># of papers</th>
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<tr>
<td>3335</td>
<td>Image Display</td>
<td>Yongmin Kim, Seong K. Mun</td>
<td>60</td>
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<td>3337</td>
<td>Physiology and Function from Multidimensional Images</td>
<td>Eric A. Hoffman</td>
<td>43</td>
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<td>3338</td>
<td>Image Processing</td>
<td>Kenneth M. Hanson</td>
<td>123</td>
</tr>
<tr>
<td>3339</td>
<td>PACS Design and Evaluation: Engineering and Clinical Issues</td>
<td>Steven C. Horii, G. James Blaine</td>
<td>15</td>
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<tr>
<td>3340</td>
<td>Image Perception</td>
<td>Harold L. Kundel</td>
<td>25</td>
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<td>3341</td>
<td>Ultrasonic Transducer Engineering</td>
<td>K. Kirk Shung</td>
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### 1999
**Medical Imaging 1999: Physics of Medical Imaging**
San Diego, CA Feb 21-23
Vol. 3659 (In 2 vol) 499 papers (99 in Physics) Attendance: 1123

**Sponsors, Co-Sponsors & Supporting Organizations**
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RSNA; SCAR

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**Program Committee**
Larry E. Antonuk; Jacob Beutel; Ian A. Cunningham; Frank A. DiBianca; Robert J. Endorf; Gary S. Keyes; Hans Roehrig; Robert F. Wagner; Martin J. Yaffe; Richard L. Van Metter; Herbert D. Zeman

**Sessions**
- Image Quality and X-Ray Physics I - John M. Boone
  - Image Quality and X-Ray Physics II - Hans Roehrig
  - Volume Imaging I - Herbert D. Zeman
  - Volume Imaging II - Robert J. Endorf
  - Mammographic Imaging - Martin J. Yaffe
  - Film/Screen and CR Imaging - Ian A. Cunningham

**Other Conferences**

<table>
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<tr>
<th>Vol #</th>
<th>Title</th>
<th>Editor/Conference Chair</th>
<th># of papers</th>
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<td>3658</td>
<td>Image Display</td>
<td>Yongmin Kim, Seong K. Mun</td>
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<tr>
<td>3660</td>
<td>Physics and Function from Multidimensional Images</td>
<td>Chien-Tzu Chen, Anne V. Clough</td>
<td>51</td>
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<td>3661</td>
<td>Image Processing</td>
<td>Kenneth M. Hanson</td>
<td>170</td>
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<tr>
<td>3662</td>
<td>PACS Design and Evaluation: Engineering and Clinical Issues</td>
<td>Blaine, Steven C. Horii</td>
<td>52</td>
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<tr>
<td>3663</td>
<td>Image Perception and Performance</td>
<td>Elizabeth A. Kupinski</td>
<td>30</td>
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<td>Ultrasonic Transducer Engineering</td>
<td>K. Kirk Shung</td>
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</tr>
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</table>
2000

Medical Imaging 2000: Physics of Medical Imaging
San Diego, CA  Feb 13-15
Vol. 3977  493 papers (71 in Physics)  Attendance: 1082

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CDRH; EMBS; IS&T; NEMA; RSNA; SCAR

Chairs
James T. Dobbins III, John M. Boone

Program Committee
Larry E. Antonuk, Jacob Beutel, Ian A. Cunningham, Frank A. DiBianca, Gary S. Kayes, Andrew D. A. Maidment, Robert A. Street, Robert F. Wagner; Martin J. Yaffe

X-ray Detectors I - John M. Boone

Fluoroscopic Imaging - Gary S. Kayes

Mammography I - Martin J. Yaffe

Microscopy - James T. Dobbins III

Mammography II - Andrew D. A. Maidment

Computed Tomography and MRI - Frank A. DiBianca

New Frontiers - Jacob Beutel

Volume Imaging - Ian A. Cunningham

X-ray Detectors II - Larry E. Antonuk

Optimization of Image Quality - Robert F. Wagner

Other Conferences
Vol # Title Editor/Conference Chair papers
3976 Image Display and Visualization Seong K. Mun 62
3978 Physiology and Function from Multidimensional Images Chiu-Tu Chen, Anne V. Clough 57
3979 Image Processing Kenneth H. Hanson 166
3980 PACS Design and Evaluation: Engineering and Clinical Issues G. James Blair, Eric L. Siegel 50
3981 Image Perception and Performance Elizabeth A. Krupinski 36
3982 Ultrasonic Imaging & Signal Process. K. Kirk Shung, Michael F. Insana 46

2001

Medical Imaging 2001: Physics of Medical Imaging
San Diego, CA  Feb 17-23
Vol. 4520  802 papers (103 in Physics)  Attendance: 1195

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RSNA; SCAR

Chairs
Larry E. Antonuk, Martin J. Yaffe

Program Committee
Katherine P. Andriole, Tom J. Bruijns, Ian A. Cunningham, James T. Dobbins III, Michael J. Flynn, Andrew D. Maidment, Robert A. Street, Robert F. Wagner, John Yorkston

Sessions
X-ray Detectors I - Larry E. Antonuk

Imaging Physics I - Ian A. Cunningham

Fluoroscopic Imaging - Katherine P. Andriole

Mammography I - Andrew D. Maidment

X-ray Detectors II - Robert A. Street

CT/MRI - Michael J. Flynn

Novel Imaging Methods I - James T. Dobbins III

Imaging Physics II - Martin J. Yaffe

Volume Imaging - Tom J. Bruijns

Novel Imaging Methods II - John Yorkston

X-ray Detectors III - Robert F. Wagner

Other Conferences
Vol # Title Editor/Conference Chair papers
4519 Visualization, Display, and Image-Guided Procedures Seong K. Mun 83
4521 Physiology and Function from Multidimensional Images Chiu-Tu Chen, Anne V. Clough 62
4522 Image Processing Kenneth H. Hanson 203
4523 PACS and Integrated Medical Information System Design & Evaluation Eliot L. Siegel, H. K. Huang 56
4524 Image Perception and Performance E.A. Krupinski, Dev P. Chakraborty 31

2002

Medical Imaging 2002: Physics of Medical Imaging
San Diego, CA  23 - 28 February
Vol. 4682  564 papers (90 in Physics)  Attendance: 1142

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RSNA; SCAR

Chairs
Larry E. Antonuk, Martin J. Yaffe

Program Committee
Katherine P. Andriole; John M. Boone; Tom J. Bruijns; Michael J. Flynn; Paul R. Granfors; Andrew D. Maidment; Robert A. Street; John Yorkston; Wei Zhao

Sessions
X-ray Detectors I - Imaging Physics

Volume Imaging I - Breast Imaging

Volume Imaging II - Novel Imaging Methods I

Fluoroscopy/Real Time Volume Imaging III

X-Ray Detectors II - X-Ray Detectors Imaging Physics II

X-Ray Detectors III - Novel Imaging Methods II - Poster Session

Other Conferences
Vol # Title Editor/Conference Chair papers
4681 Visualization, Image-Guided Procedures, and Display Seong K. Mun 82
4683 Physiology and Function from Multidimensional Images Anne V. Clough, Chiu-Tu Chen 53
4684 Image Processing Milan Sonka, J. Michael Fitzpatrick 168
4685 PACS and Integrated Medical Information System Design & Evaluation Eliot L. Siegel, H. K. Huang 54
4686 Image Perception, Observer Performance, and Technology Assessment Dev P. Chakraborty, Elizabeth A. Krupinski 40
4687 Ultrasound Imaging and Signal Processing Michael F. Insana, William F. Walker 47

2003

Medical Imaging 2003: Physics of Medical Imaging
San Diego, CA  Feb 15-20
Vol. 5030  636 papers (108 in Physics)  Attendance: 1073

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CDRH; IS&T; NEMA; RSNA; SCAR

Chairs
Martin J. Yaffe, Larry E. Antonuk

Program Committee
Katherine P. Andriole, Harrison H. Barrett, John M. Boone, Tom J. C. Bruijns, James T. Dobbins III, Michael J. Flynn, Paul R. Granfors, John Yorkston; Wei Zhao

Sessions
Imaging Physics I - John M. Boone

X-Ray Detectors I - Larry E. Antonuk

CT - Paul R. Granfors

Breast Imaging I - Martin J. Yaffe

X-Ray Detectors II - Wei Zhao

Novel Imaging Methods - Harrison H. Barrett

Breast Imaging II - John Yorkston

Volume Imaging - US/Computed Tomography - Michael J. Flynn

Imaging Physics II - James T. Dobbins III

X-Ray Detectors III - Tom J. C. Bruijns

Breast Imaging III - Larry E. Antonuk

Other Conferences
Vol # Title Editor/Conference Chair papers
5020 Visualization, Image-Guided Procedures, and Display Robert L. Gagnon, Jr. 86
5021 Physiology and Function, Methods, Systems, and Applications Anne V. Clough, Arct A. Amri 63
5022 Image Processing Milan Sonka, J. Michael Fitzpatrick 205
5023 PACS and Integrated Medical Information System Design & Evaluation H. K. Huang, Osman M. Rafi 57
5024 Image Perception, Observer Performance, and Task Assessment Dev P. Chakraborty, Elizabeth A. Krupinski 59
5025 Ultrasound Imaging & Signal Processing William F. Walker, Michael F. Insana 56

xxxiii
2011

Medical Imaging 2011: Physics of Medical Imaging

Lake Buena Vista, FL 13–17 February
Vol. 7961 864 papers (204 in Physics) Attendance: 1136

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CARS; IS&T MIPS; RSNA; SIIM; SMI; DICOM

Chairs
Norbert J. Pelc, Ehsan Samei, Robert M. Nishikawa

Program Committee
Guang-Hong Chen; Dianna Cody; Mats Danielsson; Maria Drangova; Thomas Flohr; Stephen J. Glick; Michael Grass; Christoph Hoeschen; Marc Kachelriess; Karim S. Karim; Hee-Joung Kim; Despina Kontos; Iacovos Kyprianou; Jinyi Qi; John A. Rowlands; John M. Sabol; Taly Gilat Schmidt; Jeffrey H. Siewerdsen; Katsuyuki Taguchi; Anders Tingberg; Bruce R. Whiting; John Yorkston;

Sessions
Keynote and Imaging and Health Economics - Norbert J. Pelc; Ehsan Samei
X-ray Imaging - John A. Rowlands; Christoph Hoeschen
Metrology - Robert M. Nishikawa; John Yorkston
Iterative and Statistical Reconstruction - Jinyi Qi; Guang-Hong Chen
Detectors I & II- John Yorkston; John A. Rowlands / Karim S. Karim; Mats Danielsson
Breast Imaging - Anders Tingberg; Stephen J. Glick
Tomosynthesis I: Reconstruction - John M. Sabol; Michael Grass
Tomosynthesis II - Despina Kontos; Anders Tingberg
X-ray Imaging: Phase Contrast Diffraction - Jeffrey H. Siewerdsen; Taly Gilat Schmidt
Image Reconstruction - Bruce R. Whiting; Katsuyuki Taguchi
CT III: Multi-energy - Thomas G. Flohr; John M. Sabol
Novel Systems - Mats Danielsson; Taly Gilat Schmidt
CT IV: Cone Beam - Maria Drangova; Marc Kachelriess
Dose - Iacovos S. Kyprianou; Hee-Joung Kim

Two Special Sessions on Dose with a Panel Discussion - Ehsan Samei; Dianna D. Cody / Christoph Hoeschen; Michael F. McNitt-Gray / Ehsan Samei
2012

Medical Imaging 2012: Physics of Medical Imaging

San Diego, CA  Feb 5-9
Vol. 8313  909 papers (233 in Physics)  Attendance: ?

Sponsors, Co-Sponsors & Supporting Organizations
SPIE; AAPM; APS; CARS; MIPS; RSNA; SIIM; SMI; WMIS; DICOM

Chairs
Norbert J. Pelc, Robert M. Nishikawa, Bruce Whiting

Program Committee
Hilde Bosmans; Guang-Hong Chen; Dianna D Cody; Mats E Danielsson; Maria Drangova; Thomas G. Flohr; Stephen J. Glick; Michael Grass; Christoph Hoeschen; Marc Kachelriess; Karim S Karim; Hee-Joung Kim; Despina Kontos; Iacovos S. Kyprianou; Joseph Y Lo; Jinyi Qi; John A Rowlands; John M Sabol; Taly G. Schmidt; Jeffrey H. Siewerdsen; Anders Tingberg; John Yorkston

Sessions
Keynote and 3D Breast Imaging - Norbert J. Pelc; Robert M. Nishikawa
3D Breast Imaging - Hilde Bosmans; Joseph Y. Lo
Breast Multi-Energy/Photon Counting - Mats E. Danielsson; Stephen J. Glick
Mammography - Anders Tingberg; Despina Kontos
X-Ray Imaging - Hee-Joung Kim; Karim S. Karim
Small Animal Imaging - John Yorkston; Maria Drangova
Photon Counting Systems and Techniques - Taly G. Schmidt; Jeffrey H. Siewerdsen
General Radiography and Fluoroscopy - John A. Rowlands; Hee-Joung Kim
Cone Beam CT - Iacovos S. Kyprianou; John Yorkston
CT - Dianna D. Cody; Marc Kachelriess
CT Detection Performance - Jinyi Qi; Bruce R. Whiting
Dose - Christoph Hoeschen; Dianna D. Cody
Reconstruction I & II - Guang-Hong Chen; Michael Grass/ Thomas Flohr; Jeff Siewerdsen
Tomosynthesis Reconstruction - John M. Sabol; Iacovos S. Kyprianou
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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</thead>
<tbody>
<tr>
<td>AAMI</td>
<td>Association for the Advancement of Medical Instrumentation</td>
</tr>
<tr>
<td>AAPM</td>
<td>American Association of Physicists in Medicine</td>
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<tr>
<td>ACR</td>
<td>American College of Radiology</td>
</tr>
<tr>
<td>APS</td>
<td>American Physiological Society</td>
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<tr>
<td>ARRS</td>
<td>American Roentgen Ray Society</td>
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<tr>
<td>ASNR</td>
<td>American Society of Neuroradiology</td>
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<tr>
<td>BIOS</td>
<td>Biomedical Optics Society</td>
</tr>
<tr>
<td>BRH</td>
<td>Bureau of Radiological Health, Department of Health, Education And Welfare</td>
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<tr>
<td>CARS</td>
<td>Computer Assisted Radiology and Surgery</td>
</tr>
<tr>
<td>CDRH</td>
<td>Center for Devices and Radiological Health, FDA</td>
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<tr>
<td>DICOM</td>
<td>The DICOM Standards Committee</td>
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<tr>
<td>EFOMP</td>
<td>European Federation of Organizations for Medical Physics</td>
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<tr>
<td>EMBG</td>
<td>IEEE Engineering in Medicine and Biology Group</td>
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<tr>
<td>EMBS</td>
<td>IEEE—The Institute of Electrical and Electronics Engineers/Engineering in Medicine and Biology Society</td>
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<tr>
<td>IEEE-CS</td>
<td>IEEE Computer Society, Technical Committee on Computational Medicine</td>
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<tr>
<td>IRS</td>
<td>Institute for Regulatory Science</td>
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<tr>
<td>IS&amp;T</td>
<td>The Society for Imaging Science and Technology</td>
</tr>
<tr>
<td>JPL</td>
<td>Jet Propulsion Laboratory</td>
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<tr>
<td>MIPS</td>
<td>Medical Image Perception Society</td>
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<tr>
<td>NEMA</td>
<td>National Electrical Manufacturers Association/Diagnostic Imaging and Therapy, Systems Division</td>
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<tr>
<td>OSA</td>
<td>The Optical Society of America</td>
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<tr>
<td>RISC</td>
<td>Radiology Information System Consortium</td>
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<tr>
<td>RSNA</td>
<td>Radiological Society of North America</td>
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<tr>
<td>SCAR</td>
<td>Society for Computer Applications in Radiology</td>
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<tr>
<td>SIIM</td>
<td>Society for Imaging Informatics in Medicine</td>
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<tr>
<td>SMII</td>
<td>The Society for Molecular Imaging</td>
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<tr>
<td>SNM</td>
<td>The Society of Nuclear Medicine</td>
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<tr>
<td>SPIE</td>
<td>The Society of Photo-Optical Instrumentation Engineers</td>
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<tr>
<td>SPSE</td>
<td>The Society of Photographic Scientists and Engineers</td>
</tr>
<tr>
<td>SRE</td>
<td>Society for Radiological Engineering</td>
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<tr>
<td>UWMS</td>
<td>University of Wisconsin Medical School</td>
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<tr>
<td>WMIS</td>
<td>World Molecular Imaging Society</td>
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</table>