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Breast Imaging

11th International Workshop, IWDM 2012
Philadelphia, PA, USA, July 8-11, 2012
Proceedings

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Preface

This volume of Springer's Lecture Notes in Computer Science presents the scientific proceedings of the 11th International Workshop on Breast Imaging (IWDM 2012), which was held July 8–11, 2012 in Philadelphia, Pennsylvania, USA. Formerly called the International Workshop on Digital Mammography, the new name recognizes the move in breast imaging towards more recent emerging technologies and multimodality imaging solutions. The IWDM meetings bring together a diverse group of researchers, clinicians and representatives of industry, who are jointly committed to developing technology for early detection and subsequent patient management of breast cancer. The conference series was initiated at a 1993 meeting of the SPIE in San Jose, with subsequent meetings hosted every two years by researchers around the world. Previous meetings have been held in York (1994), Chicago (1996), Nijmegen (1998), Toronto (2000), Bremen (2002), Durham (2004), Manchester (2006), Tucson (2008) and Girona (2010).

The IWDM 2012 was designed as a platform to present the latest technological developments and clinical experiences of novel breast imaging technologies, including digital mammography, tomosynthesis, CT, MR, ultrasound, optical and molecular imaging. Additional topics include multimodality imaging, image processing and visualization, and computer-aided imaging. A total of 120 papers were submitted to the conference from research groups in 24 countries. Each four-page extended abstract was reviewed in a fully-blinded process by at least two members of the Scientific Program Committee, which led to the final selection of 42 oral presentations and 58 poster presentations. The final 8-page papers were reviewed by the volume editors. Galley proofs were approved by the corresponding author(s) of each paper.

The proffered presentations were organized into 10 sequential oral sessions and 2 poster sessions during the two and a half day conference. The session titles give insight into the changes that have occurred in breast imaging in the 19 years since the first Digital Mammography conference in San Jose. Today digital mammography is the clinical standard of care. As a result, this year only one session was devoted to the technology of digital mammography, with a primary emphasis on image quality and radiation dose. Rather, one sees that digital mammography is the enabling technology for a number of new applications, including image-based breast cancer risk assessment. Thus, substantial work was presented on image-based measures of breast cancer risk, and other quantitative measures used in the detection, diagnosis, treatment and prevention of breast cancer.

A number of new and adjunctive technologies were also discussed in the workshop. In particular, digital breast tomosynthesis was heavily represented, both in papers covering system development and clinical application. Related topics

in image processing, computer-aided diagnosis and quantitative imaging were also presented. Other new technologies including breast computed tomography and breast molecular imaging, and advances in adjunctive technologies including magnetic resonance imaging and ultrasound were well represented.

The invited speakers were chosen to illuminate the trends in breast imaging and stimulate future developments. In a trend spanning the last four IWDM meetings, tomosynthesis was again discussed in an invited lecture. This year, Emily F. Conant (University of Pennsylvania, USA) and Etta D. Pisano (Medical University of South Carolina, USA) presented “Tomosynthesis: Clinical Trials and Clinical Implementation”. Thus, in a 6 year period, we have gone from papers covering the fundamentals of the technology and positing the role for tomosynthesis to papers discussing the successes of the technology.

John M. Lewin (Rose Breast Center, USA) presented a talk entitled “Contrast-enhanced Digital Mammography and Tomosynthesis – Review and Update”. Contrast-enhanced breast radiography has the potential to combine the morphologic and functional signs of breast cancer. David A. Mankoff (University of Pennsylvania, USA) discussed “Molecular Imaging of the Breast: Clinical and Biological Considerations” in a complementary paper outlining numerous other applications of quantitative breast imaging. Katrina Armstrong (University of Pennsylvania, USA) provided a thought-provoking talk entitled “Moving to an Individualized Paradigm for Breast Cancer Screening and Prevention: Opportunities and Challenges”. In this presentation, the role of imaging was reviewed in light of the larger clinical context of breast cancer. Finally, Martin J. Yaffe and Gina Clarke (University of Toronto, Canada) provided an overview of “Quantitative Imaging Techniques in Pathology for Management of Breast Cancer”. In this presentation, they demonstrated how the role of imaging continues to expand and challenge researchers.

Finally, a meeting as large and successful as the IWDM 2012 is only possible through the tireless work of many people. The members of the Scientific Program Committee did an outstanding job in reviewing the papers and providing detailed critiques to the authors as part of the peer-review process. The local arrangements for the conference were skillfully handled by Lori Ehrich and Angela Scott, who are normally responsible for the continuing education program for the Department of Radiology at the University of Pennsylvania. Technical support of the meeting was provided by Joseph Chui of the Physics Section. Joe has worked hard to keep the various servers running and databases communicating together. Special thanks need to go to Roshan Karunamuni and Raymond Acciavatti who expended huge effort to put the 100 individual submissions into a single cohesive book. Finally, thanks go to Emily Conant and Mitch Schnall for helping to prepare the proposal for this meeting two years ago, and to Predrag Bakic and Sara Gavenonis for making this meeting a reality.

Organization

The 11th International Workshop on Breast Imaging (IWDM 2012) was organized by the Physics and Breast Imaging Sections of the Department of Radiology of the University of Pennsylvania. The organizers would like to acknowledge the following individuals for their assistance and hard work in making this workshop possible.

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Table of Contents

Session 1: Contrast-Enhanced Imaging

Pre-clinical Evaluation of Tumour Angiogenesis with Contrast-Enhanced Breast Tomosynthesis	1
<i>Melissa L. Hill, Kela Liu, James G. Mainprize, Ronald B. Levitin, Rushin Shojaii, and Martin J. Yaffe</i>	
The Effect of Amorphous Selenium Thickness on Imaging Performance of Contrast Enhanced Digital Breast Tomosynthesis	9
<i>Yue-Houng Hu, David A. Scaduto, and Wei Zhao</i>	
Contrast Optimization in Clinical Contrast-Enhanced Digital Mammography Images	17
<i>Juan-Pablo Cruz-Bastida, Iván Rosado-Méndez, Héctor Pérez-Ponce, Yolanda Villaseñor, Héctor A. Galván, Flavio E. Trujillo-Zamudio, Luis Benítez-Bribiesca, and María-Ester Brandan</i>	
Determination of System Geometrical Parameters and Consistency between Scans for Contrast-Enhanced Digital Breast Tomosynthesis	24
<i>David A. Scaduto and Wei Zhao</i>	
Initial Experience with Dual-Energy Contrast-Enhanced Digital Breast Tomosynthesis in the Characterization of Breast Cancer	32
<i>Sara Gavenonis, Kristen Lau, Roshan Karunamuni, Yiheng Zhang, Baorui Ren, Chris Ruth, and Andrew D.A. Maidment</i>	

Session 2: Digital Mammography Methods

Mammographic Segmentation and Risk Classification Using a Novel Binary Model Based Bayes Classifier	40
<i>Wenda He, Erika R.E. Denton, and Reyer Zwiggelaar</i>	
Intensity-Based MRI to X-ray Mammography Registration with an Integrated Fast Biomechanical Transformation	48
<i>Thomy Mertzanidou, John H. Hipwell, Lianghao Han, Zeike Taylor, Henkjan Huisman, Ulrich Bick, Nico Karssemeijer, and David J. Hawkes</i>	
Comparison of Experimental, MANTIS, and hybridMANTIS X-ray Response for a Breast Imaging CsI Detector	56
<i>Diksha Sharma and Aldo Badano</i>	

Breast Mass Classification Using Orthogonal Moments	64
<i>Fabián Narváez and Eduardo Romero</i>	

Session 3: Tomosynthesis System Design

A Task-Specific Argument for Variable-Exposure Breast Tomosynthesis	72
<i>Stefano Young, Andreu Badal, Kyle J. Myers, and Subok Park</i>	
Detective Quantum Efficiency of a CsI-CMOS X-ray Detector for Breast Tomosynthesis Operating in High Dynamic Range and High Sensitivity Modes	80
<i>Tushita Patel, Kelly Klanian, Zongyi Gong, and Mark B. Williams</i>	

Poster Session 1

Multimodal Classification of Breast Masses in Mammography and MRI Using Unimodal Feature Selection and Decision Fusion	88
<i>Jan M. Lesniak, Guido van Schie, Christine Tanner, Bram Platel, Henkjan Huisman, Nico Karssemeijer, and Gabor Székely</i>	
Comparison of Lesion Size Using Area and Volume in Full Field Digital Mammograms	96
<i>Jelena Bozek, Michiel Kallenberg, Mislav Grgic, and Nico Karssemeijer</i>	
Very High Contrast and Very High Spatial Resolution 2-D, 2.5-D and 3-D Breast Tissue Visualization under X-ray Dark Field Imaging	104
<i>Masami Ando, Qingkai Huo, Shu Ichihara, Tokiko Endo, Tetsuya Yuasa, Naoki Sunaguchi, and Kensaku Mori</i>	
Detecting Clusters of Microcalcifications with a Cascade-Based Approach	111
<i>Alessandro Bria, Claudio Marrocco, Mario Molinara, and Francesco Tortorella</i>	
Diagnostic Impact of Adjunction of Digital Breast Tomosynthesis (DBT) to Full Field Digital Mammography (FFDM) and in Comparison with Full Field Digital Mammography (FFDM)	119
<i>Nachiko Uchiyama, Takayuki Kinoshita, Takashi Hojo, Sota Asaga, Junko Suzuki, Shiho Gomi, Chieko Nagashima, Yoko Kawawa, and Kyoichi Otsuka</i>	
Ethnic Variation in Volumetric Breast Density	127
<i>Sadaf Hashmi, Jamie C. Sergeant, Julie Morris, Sigrid Whiteside, Paula Stavrinou, D. Gareth Evans, Tony Howell, Mary Wilson, Nicky Barr, Caroline Boggis, and Susan M. Astley</i>	

Personalizing Mammographic Dosimetry Using Multilayered Anatomy-Based Breast Models	134
<i>Mariela A. Porras-Chaverri, John R. Vetter, and Ralph Highnam</i>	
A Directional Small-Scale Tissue Model for an Anthropomorphic Breast Phantom.....	141
<i>Ingrid Reiser, Beverly A. Lau, Robert M. Nishikawa, and Predrag R. Bakic</i>	
Simulation of Three Material Partial Volume Averaging in a Software Breast Phantom	149
<i>Feiyu Chen, David D. Pokrajac, Xiquan Shi, Fengshan Liu, Andrew D.A. Maidment, and Predrag R. Bakic</i>	
Iterative Reconstruction with Monte Carlo Based System Matrix for Dedicated Breast PET.....	157
<i>Krishnendu Saha, Kenneth J. Straus, and Stephen J. Glick</i>	
Comparison of Contact Spot Imaging on a Scanning Mammography System to Conventional Geometric Magnification Imaging.....	165
<i>Gillian Egan, Elizabeth Keavey, and Niall Phelan</i>	
Region Matching in the Temporal Study of Mammograms Using Integral Invariant Scale-Space	173
<i>Faraz Janan and Sir Michael Brady</i>	
Characterizing Breast Phenotype with a Novel Measure of Fibroglandular Structure.....	181
<i>John H. Hipwell, Lewis D. Griffin, Patsy J. Whelehan, Wenlong Song, Xiyang Zhang, Jan M. Lesniak, Sarah Vinnicombe, Andy Evans, Jonathan Berg, and David J. Hawkes</i>	
Performance of Computed Radiography and Direct Digital Radiography in a Screening Setting: Effect on the Screening Indicators	189
<i>Chantal Van Ongeval, Sandra Postema, André van Steen, Gretel Vande Putte, Erik van Limbergen, Federica Zanca, and Hilde Bosmans</i>	
A Quality Control Framework Using Task-Based Detectability Measurements for Digital Mammography	197
<i>Aili K. Bloomquist, James G. Mainprize, Gordon E. Mawdsley, and Martin J. Yaffe</i>	
Longitudinal Change in Mammographic Density and Association with Breast Cancer Risk: A Case-Control Study	205
<i>Chew Ting, Susan M. Astley, Julie Morris, Paula Stavrinou, Mary Wilson, Nicky Barr, Caroline Boggis, and Jamie C. Sergeant</i>	

Long-Term Stability of Image Quality Measurements for Two Digital Mammography Systems	212
<i>Jennifer M. Oduko and Kenneth C. Young</i>	
Characterization of Spatial Luminance Noise in Stereoscopic Displays for Breast Imaging	220
<i>Cecilia Marini-Bettolo, Joel Wang, Wei-Chung Cheng, Robert J. Jennings, and Aldo Badano</i>	
Volumetric and Area-Based Breast Density Measurement in the Predicting Risk of Cancer at Screening (PROCAS) Study	228
<i>Jamie C. Sergeant, Jane Warwick, D. Gareth Evans, Anthony Howell, Michael Berks, Paula Stavrinou, Sarah Sahin, Mary Wilson, Alan Hufton, Iain Buchan, and Susan M. Astley</i>	
Breast Cancer Risk Prediction via Area and Volumetric Estimates of Breast Density	236
<i>Brad M. Keller, Emily F. Conant, Huen Oh, and Despina Kontos</i>	
Fully-Automated Fibroglandular Tissue Segmentation in Breast MRI . . .	244
<i>Shandong Wu, Susan Weinstein, Brad M. Keller, Emily F. Conant, and Despina Kontos</i>	
Inferring the Breast Periphery from an Image When Measuring Volumetric Breast Density	252
<i>Christopher Tromans and Sir Michael Brady</i>	
Digital Scatter Removal for Mammography and Tomosynthesis Image Acquisition	260
<i>Christopher Tromans, Mary Cocker, and Sir Michael Brady</i>	
Filtering of Poisson Noise in Digital Mammography Using Local Statistics and Adaptive Wiener Filter	268
<i>Marcelo A.C. Vieira, Predrag R. Bakic, Andrew D.A. Maidment, Homero Schiabel, and Nelson D.A. Mascarenhas</i>	
A Novel Workflow-Centric Breast MRI Reading Prototype Utilizing Multitouch Gestures	276
<i>Markus Harz, Felix Ritter, Simon Benten, Kathy Schilling, and Heinz-Otto Peitgen</i>	
Evaluation of Various Mammography Phantoms for Image Quality Assessment in Digital Breast Tomosynthesis	284
<i>Claudia C. Brunner, Raymond J. Acciavatti, Predrag R. Bakic, Andrew D.A. Maidment, Mark B. Williams, Richard Kaczmarek, and Kish Chakrabarti</i>	

Effects of Medical Display Luminance, Contrast and Temporal Compensation on CHO Detection Performance at Various Browsing Speeds and on Digital Breast Tomosynthesis Images	292
<i>Cédric Marchessoux, Ali N. Avanaki, Predrag R. Bakic, Tom R.L. Kimpe, and Andrew D.A. Maidment</i>	
The Impact of Reduced Injected Radioactivity on Image Quality of Molecular Breast Imaging Tomosynthesis	300
<i>Olivia Sullivan, Zongyi Gong, Kelly Klanian, Tushita Patel, and Mark B. Williams</i>	
Automatic Seed Placement for Breast Lesion Segmentation on US Images	308
<i>Joan Massich, Fabrice Meriaudeau, Melcior Sentís, Sergi Ganau, Elsa Pérez, Robert Martí, Arnau Oliver, and Joan Martí</i>	
Session 4: Tomosynthesis - Image Quality and Dose	
Comparison of Breast Doses for Digital Tomosynthesis Estimated from Patient Exposures and Using PMMA Breast Phantoms	316
<i>David R. Dance, Celia J. Strudley, Kenneth C. Young, Jennifer M. Oduko, Patsy J. Whelehan, and E.H. Lindsay Mungutroy</i>	
Phantoms for Quality Control Procedures of Digital Breast Tomosynthesis	322
<i>Ramona W. Bouwman, Oliver Diaz, Kenneth C. Young, Ruben E. van Engen, Wouter J.H. Veldkamp, and David R. Dance</i>	
Development of a Quality Control Protocol for Digital Breast Tomosynthesis Systems in the TOMMY Trial	330
<i>Celia J. Strudley, Kenneth C. Young, Jennifer M. Oduko, Pdraig Looney, Annabel Barnard, and Fiona J. Gilbert</i>	
A Modelling Framework for Evaluation of 2D-Mammography and Breast Tomosynthesis Systems	338
<i>Premkumar Elangovan, Alistair Mackenzie, Oliver Diaz, Alaleh Rashidnasab, David R. Dance, Kenneth C. Young, Lucy M. Warren, Eman Shaheen, Hilde Bosmans, Predrag R. Bakic, and Kevin Wells</i>	
Is the Outcome of Optimizing the System Acquisition Parameters Sensitive to the Reconstruction Algorithm in Digital Breast Tomosynthesis?	346
<i>Rongping Zeng, Subok Park, Predrag R. Bakic, and Kyle J. Myers</i>	

Session 5: Clinical Tomosynthesis

Usefulness of Adjunction of Digital Breast Tomosynthesis (DBT) to Full-Field Digital Mammography (FFDM) in Evaluation of Pathological Response after Neoadjuvant Chemotherapy (NAC) for Breast Cancer ...	354
<i>Nachiko Uchiyama, Takayuki Kinoshita, Takashi Hojo, Sota Asaga, Junko Suzuki, Yoko Kawawa, and Kyoichi Otsuka</i>	
The Morphology of Microcalcifications in 2D Digital Mammography and Breast Tomosynthesis: Is It Different?	362
<i>Eman Shaheen, Chantal Van Ongeval, Federica Zanca, Lesley Cockmartin, Nicholas Marshall, Frederik De Keyzer, Kenneth C. Young, David R. Dance, and Hilde Bosmans</i>	
Comparison of 15° and 30° Angle Acquisition Digital Breast Tomosynthesis for Visualization and Characterization of Breast Abnormalities	369
<i>Laurie L. Fajardo, Limin Yang, and Jeong-Mi Park</i>	
Differences in Radiologists' Experiences and Performance in Breast Tomosynthesis	377
<i>Tony Svahn, Kristina Lång, Ingvar Andersson, and Sophia Zackrisson</i>	
Proposing an Acquisition Geometry That Optimizes Super-Resolution in Digital Breast Tomosynthesis	386
<i>Raymond J. Acciavatti and Andrew D.A. Maidment</i>	

Session 6: Functional Breast Imaging

Converting One Set of Mammograms to Simulate a Range of Detector Imaging Characteristics for Observer Studies	394
<i>Alistair Mackenzie, David R. Dance, Oliver Diaz, Annabel Barnard, and Kenneth C. Young</i>	
Quantification of Tc-99m Sestamibi Distribution in Normal Breast Tissue Using Dedicated Breast SPECT-CT	402
<i>Steve D. Mann, Kristy L. Perez, Emily K.E. McCracken, Jainil P. Shah, Kingshuk R. Choudhury, Terence Z. Wong, and Martin P. Tornai</i>	
Impact of Digitalization of Mammographic Units on Average Glandular Doses in the Flemish Breast Cancer Screening Program	410
<i>An De Hauwere and Hubert Thierens</i>	

An Examination of Silver as a Radiographic Contrast Agent in Dual-Energy Breast X-ray Imaging	418
<i>Roshan Karunamuni, Ajlan Al Zaki, Anatoliy V. Popov, E. James Delikatny, Sara Gavenonis, Andrew Tsourkas, and Andrew D.A. Maidment</i>	

Session 7: Breast CT

Initial Evaluation of a Newly Developed High Resolution CT Imager for Dedicated Breast CT	426
<i>Jainil P. Shah, Steve D. Mann, Andrew M. Polemi, Martin P. Tornai, Randolph L. McKinley, George Zentai, Michelle Richmond, and Larry Partain</i>	
Comparison of Lesion Extent and Contrast-Agent Uptake in Breast Tomosynthesis versus Cone-Beam Breast CT	434
<i>Pablo M. de Carvalho, Ann-Katherine Carton, Răzvan Iordache, Sylvie Saab-Puong, and Serge Muller</i>	
Development and Initial Demonstration of a Low-Dose Dedicated Fully 3D Breast CT System	442
<i>Randolph L. McKinley, Martin P. Tornai, Laura A. Tuttle, Doreen Steed, and Cherie M. Kuzmiak</i>	

Poster Session 2

Correspondence among Subjective and Objective Similarities and Pathologic Types of Breast Masses on Digital Mammography	450
<i>Chisako Muramatsu, Kohei Nishimura, Mikinao Oiwa, Misaki Shiraiwa, Tokiko Endo, Kunio Doi, and Hiroshi Fujita</i>	
A Hypothesis-Test Framework for Quantitative Lesion Detection and Diagnosis	458
<i>Christopher Tromans, Guido van Schie, Nico Karssemeijer, and Sir Michael Brady</i>	
Breast Density into Clinical Practice	466
<i>Ralph Highnam, Natascha Sauber, Stamatia Destounis, Jennifer Harvey, and Dennis McDonald</i>	
Intensity Independent Texture Analysis in Screening Mammograms	474
<i>Xi-Zhao Li, Simon Williams, and Murk J. Bottema</i>	
Inter- and Intra-Observer Variability of Radiologists Evaluating CBIR Systems	482
<i>Lubomir Hadjiiski, Hyun-chong Cho, Heang-Ping Chan, Berkman Sahiner, Mark A. Helvie, Chintana Paramagul, and Alexis V. Nees</i>	

Quantification of Detection Probability of Microcalcifications at Increased Display Luminance Levels	490
<i>Tom R.L. Kimpe and Albert Xthona</i>	
Development of Computer Techniques Designed to Aid Tests of Digital Mammography Systems Quality Evaluation with the Phantom CDMAM 3.4	498
<i>Maria A.Z. Sousa, Homero Schiabel, and Regina B. Medeiros</i>	
Towards Breast Anatomy Simulation Using GPUs	506
<i>Joseph H. Chui, David D. Pokrajac, Andrew D.A. Maidment, and Predrag R. Bakic</i>	
Breast Parenchymal Pattern (BPP) Analysis: Comparison of Digital Mammograms and Breast Tomosynthesis	514
<i>Jun Wei, Heang-Ping Chan, Yao Lu, Lubomir Hadjiiski, Chuan Zhou, and Mark A. Helvie</i>	
Classification of Microcalcification Clusters Based on Morphological Topology Analysis	521
<i>Zhili Chen, Erika R.E. Denton, and Reyer Zwiggelaar</i>	
Spectral Volumetric Glandularity Assessment	529
<i>André Goößen, Harald S. Heese, Klaus Erhard, and Björn Norell</i>	
Power-Law, Beta, and (Slight) Chaos in Automated Mammography Breast Structure Characterization	537
<i>Joep J.M. Kierkels, Wouter J.H. Veldkamp, Ramona W. Bouwman, and Ruben E. van Engen</i>	
Breast Density Measurement in Full-Field Digital Mammography: System Calibration and Stability	545
<i>Charlotte Kerrison, Oliver Putt, Jamie C. Sergeant, Tina Dunn, Jennifer Diffey, Susan M. Astley, and Alan Hufton</i>	
A Method for Lesion Visibility Prediction in Mammograms by Local Analysis of Spectral Anatomical Noise	553
<i>Stephanie Simbt, Hanns-Ingo Maack, and Harald S. Heese</i>	
Adapting Breast Density Classification from Digitized to Full-Field Digital Mammograms	561
<i>Meritzell Tortajada, Arnau Oliver, Robert Martí, Mariona Vilagran, Sergi Ganau, Lidia Tortajada, Melcior Sentís, and Jordi Freixenet</i>	
Improvements and Performance of Diagnostic Compositional Imaging Using a Novel Dual-Energy X-ray Technique	569
<i>Fred Duewer, Chris I. Flowers, Karla Kerlikowske, Serghei Malkov, Bonnie N. Joe, and John A. Shepherd</i>	

Monte Carlo Simulation of a-Se X-ray Detectors for Breast Imaging: Effect of Nearest-Neighbor Recombination Algorithm on Swank Noise	575
<i>Yuan Fang, Diksha Sharma, Andreu Badal, Karim S. Karim, and Aldo Badano</i>	
Initial Result of a Prospective Study: Comparison between a Low Dose 3D Stereo Mammography and FFDM	583
<i>Andreas Lohre, Dirk Stoesser, Akira Hasegawa, and Cord Neitzke</i>	
Volumetric and Area-Based Measures of Mammographic Density in Women with and without Cancer	589
<i>Leila Nutine, Jamie C. Sergeant, Julie Morris, Paula Stavrinou, D. Gareth Evans, Tony Howell, Caroline Boggis, Mary Wilson, Nick Barr, and Susan M. Astley</i>	
Mammographic Parenchymal Texture Analysis for Estrogen-Receptor Subtype Specific Breast Cancer Risk Estimation	596
<i>Gopal Karemore, Brad M. Keller, Huen Oh, Julia Tchou, Mads Nielsen, Emily F. Conant, and Despina Kontos</i>	
A Phantom Study for Assessing the Effect of Different Digital Detectors on Mammographic Texture Features	604
<i>Yan Wang, Brad M. Keller, Yuanjie Zheng, Raymond J. Acciavatti, James C. Gee, Andrew D.A. Maidment, and Despina Kontos</i>	
Reduction of Patient Dose in Digital Mammography: Simulation of Low-Dose Image from a Routine Dose	611
<i>Yuki Saito, Aya Kawai, Naotoshi Fujita, Maki Yamada, and Yoshie Kodera</i>	
Comparison of Hologic's Quantra Volumetric Assessment to MRI Breast Density	619
<i>Jeff Wang, Ania Aziz, David Newitt, Bonnie N. Joe, Nola Hylton, and John A. Shepherd</i>	
2D/3D Registration for Localization of Mammographically Depicted Lesions in Breast MRI	627
<i>Torsten Hopp and Nicole V. Ruiter</i>	
Application of a Protocol for Constancy Control of Digital Breast Tomosynthesis Systems: Results and Experiences	635
<i>Kristin Pedersen, Robin L. Hammond, and Bjørn H. Østerås</i>	
Design and Evaluation of a Phantom with Structured Background for Digital Mammography and Breast Tomosynthesis	642
<i>Lesley Cockmartin, Nicholas Marshall, and Hilde Bosmans</i>	

An Experimental Comparison of Continuous Motion and Step-and-Shoot Modes in Digital Breast Tomosynthesis	650
<i>Rui Peng, Rongping Zeng, Eugene O'Bryan, Cecilia Marini-Bettolo, Berkman Sahiner, Kyle J. Myers, and Robert J. Jennings</i>	

Application of a Dynamic 4D Anthropomorphic Breast Phantom in Contrast-Based Imaging System Optimization: Dual-Energy or Temporal Subtraction?	658
<i>Nooshin Kiarashi, Sujata V. Ghate, Joseph Y. Lo, Loren W. Nolte, and Ehsan Samei</i>	

Image Processing and Registration of Opposed View 3D Breast Ultrasound	666
<i>Sumedha Sinha, Fong-Ming Hooi, Renee Pinsky, Oliver Kripfgans, and Paul Carson</i>	

Session 8: Computer-Aided Diagnosis and Image Processing

Detecting Low-Conspicuity Mammographic Findings – The Real Added Value of CAD	673
<i>Isaac Leichter, Richard Lederman, and Alexandra Manevitch</i>	

Potential of a Standalone Computer-Aided Detection System for Breast Cancer Detection in Screening Mammography	682
<i>Jaime Melendez, Clara I. Sánchez, Rianne Hupse, Bram van Ginneken, and Nico Karssemeijer</i>	

Estimating Sensitivity and Specificity in an ROC Experiment	690
<i>Robert M. Nishikawa</i>	

Level Set Breast Mass Segmentation in Contrast-Enhanced and Non-Contrast-Enhanced Breast CT	697
<i>Hsien-Chi Kuo, Maryellen L. Giger, Ingrid Reiser, John M. Boone, Karen K. Lindfors, Kai Yang, and Alexandra Edwards</i>	

Methods for Evaluating the Effectiveness of Screening Mammography Are Not Necessarily Valid for Evaluating the Effectiveness of Computer-Aided Detection in Screening Mammography	705
<i>Robert M. Nishikawa</i>	

Session 9: Tomosynthesis Reconstruction

Joint Registration and Limited-Angle Reconstruction of Digital Breast Tomosynthesis	713
<i>Guang Yang, John H. Hipwell, Christine Tanner, David J. Hawkes, and Simon R. Arridge</i>	

Dose Reduction for Digital Breast Tomosynthesis by Patch-Based Denoising in Reconstruction	721
<i>Gang Wu, James G. Mainprize, and Martin J. Yaffe</i>	
Out-of-Plane Artifact Reduction in Tomosynthesis Based on Regression Modeling and Outlier Detection.....	729
<i>Shiras Abdurahman, Anna Jerebko, Thomas Mertelmeier, Tobias Lasser, and Nassir Navab</i>	
Investigating Oblique Reconstructions with Super-Resolution in Digital Breast Tomosynthesis	737
<i>Raymond J. Acciavatti, Stewart B. Mein, and Andrew D.A. Maidment</i>	
Improving Image Quality of Digital Breast Tomosynthesis by Artifact Reduction.....	745
<i>Yao Lu, Heang-Ping Chan, Jun Wei, Lubomir Hadjiiski, and Chuan Zhou</i>	
 Session 10: Breast Density	
Automatic Volumetric Glandularity Assessment from Full Field Digital Mammograms	753
<i>André Goöfen, Harald S. Heese, and Klaus Erhard</i>	
A Breast Density-Dependent Power-Law Model for Digital Mammography	761
<i>James G. Mainprize and Martin J. Yaffe</i>	
A Calibration Approach for Single-Energy X-ray Absorptiometry Method to Provide Absolute Breast Tissue Composition Accuracy for the Long Term	769
<i>Sergei Malkov, Jeff Wang, Fred Duewer, and John A. Shepherd</i>	
Local versus Whole Breast Volumetric Breast Density Assessments and Implications	775
<i>Baorui Ren, Andrew P. Smith, and Zhenxue Jing</i>	
Author Index	783