Table of Contents

Breast Density, Texture and Risk I

Improvements to Single Energy Absorptiometry Method for Digital Mammography to Quantify Breast Tissue Density ......................................................... 1
   Serghei Malkov, Jeff Wang, and John Shepherd

Breast Density Segmentation: A Comparison of Clustering and Region Based Techniques ................................................................................................................. 9

Mammographic Segmentation Based on Texture Modelling of Tabár
Mammographic Building Blocks ........................................................................... 17
   Wenda He, Izzati Muhammah, Erika R.E. Denton, and Reyer Zwiggelaar

Analyzing Tree-Like Structures in Biomedical Images Based on Texture and Branching: An Application to Breast Imaging ......................................................... 25
   Michael Barnathan, Jingjing Zhang, Despina Kontos, Predrag Bakic, Andrew Maidment, and Vasileios Megaloookonomou

Volumetric Assessment of Breast Tissue Composition from FFDM Images .............................................................................................................................. 33
   Keith Hartman, Ralph Highnam, Ruth Warren, and Valerie Jackson

Clinical Experiences

Effect of Image Quality on Film Reading .............................................................. 40
   Susan Astley, Neil Prasad, Eve Allcock, Jenny Difffey, Yit Yoong Lim, and Caroline Boggis

A Comparison between Film-Screen Mammography and Full-Field Digital Mammography Utilizing Phase Contrast Technology in Breast Cancer Screening Programs ................................................................................ 48
   Takako Morita, Maya Yamada, Akiko Kano, Sumiya Nagatsuka, Chika Honda, and Tokiko Endo

Impact of Digital Mammography in Breast Cancer Screening: Initial Experience in a National Breast Screening Program ......................................................... 55
   N. Hambly, N. Phelan, G. Hargaden, A. O'Doherty, and F. Flanagan
Clinical Performance of Breast Tomosynthesis as a Function of Radiologist Experience Level ........................................ 61  
Andrew P. Smith, Elizabeth A. Rafferty, and Loren Niklason

BIRADS Classification in Breast Tomosynthesis Compared to Mammography and Ultrasonography ................................. 67  
Anders Tingberg, Ingvar Andersson, Debra M. Ikeda, Mark Ruschin, Tony Svahn, and Pontus Timberg

Stereoscopic Digital Mammography: Improved Accuracy of Lesion Detection in Breast Cancer Screening .............................. 74  
David J. Getty, Carl J. D’Orsi, and Ronald M. Pickett

Potential Role of FDG-PET Imaging in Defining Biology of Primary Breast Lesions .......................................................... 80  
S. Basu, A. Mavi, T. Cernek, R. Kumar, and A. Alavi

Breast Imaging Physics

Clinical Usefulness of Super High-Resolution Liquid Crystal Displays Using Independent Sub-pixel Driving Technology ......................... 84  
Katsuhiro Ichikawa, Hiroko Kawashima, Naohiro Kimura, and Mikio Hasegawa

The Effect of Tomosynthesis X-Ray Pulse Width on Measured Beam Quality .......................................................... 91  
Baorui Ren, Andrew Smith, David Aizer, Don Kennedy, Jeffrey Yorker, and Zhenxue Jing

Tomographic Dual Modality Breast Scanner .................................................. 99  
Mark B. Williams, Patricia G. Judy, Mitali J. More, Jennifer A. Harvey, Stan Majewski, James Proffitt, John McKisson, Alexander Stolin, Brian Kross, Alexander Stewart, Edward Bullard, Manish Kankaria, and Roman Janer

Dual-Energy X-Ray Absorptiometry Method Using a Full Field Digital Mammography System ............................................. 108  
Aurelie Laidevant, Serghei Malkov, Alfred Au, and John Shepherd

Ann-Katherine Carton, Christer Ullberg, Karin Lindman, Tom Francke, and Andrew Maidment

Simulation and Phantom Studies of Contrast-Enhanced Dual Energy Mammography (CEDEM) .................................................. 124  
Preliminary Evaluation of a Phase Contrast Imaging with Digital Mammography ........................................... 130
Satoru Matsuo, Hiroshi Fujita, Junji Morishita, Tetsuro Katafuchi, Chika Honda, and Junko Sugiyama

Poster Session I

Prompting in Mammography: Reproducibility ......................... 137
Stephanie Tieuw, Susan Astley, Bernice Dillon, Julie Morris, and Caroline Boggis

Synthesising Abnormal Structures in Mammograms Using Pyramid Decomposition ........................................... 143
Michael Berks, Chris Rose, Caroline Boggis, and Susan Astley

Computer-Aided Microcalcification Detection on Digital Breast Tomosynthesis Data: A Preliminary Evaluation ......................... 151
Sylvain Bernard, Serge Muller, and Jon Onativa

Temporal Analysis of Mammograms Based on Graph Matching .... 158
Fei Ma, Mariusz Bajger, and Murk J. Bottema

Temporal Subtraction Versus Dual-Energy Contrast-Enhanced Digital Breast Tomosynthesis: A Pilot Study ............................. 166
Ann-Katherine Carton, Jean Anne Currivan, Emily Conant, and Andrew Maidment

Texture-Based Simultaneous Registration and Segmentation of Breast DCE-MRI ........................................... 174
Yang Can Gong and Michael Brady

A CDMAM Image Phantom Software Improvement for Human Observer Assessment ........................................... 181
Gabriel Prieto, Margarita Chevalier, and Eduardo Guibelalde

Computerized Classification of Mammary Gland Patterns in Whole Breast Ultrasound Images ........................................... 188
Yuji Ikedo, Takako Morita, Daisuke Fukuoka, Takeshi Hara, Hiroshi Fujita, Etsuo Takada, and Tokiko Endo

Comparison between Physical Image Quality as Measured by a Newly Developed Phantom Dedicated for Digital Mammography QC and That by European Guidelines Methods ........................................... 196
Tetsuro Kusunoki, Masahiro Tagi, Kenji Yosikawa, Hiroshi Arai, Nachiko Uchiyama, Chieko Nagashima, and Hiroyuki Kobayashi
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assuring Authenticity of Digital Mammograms by Image Watermarking</td>
<td>204</td>
</tr>
<tr>
<td><em>Anthony Maeder, Jason Dowling, Anthony Nguyen, Emma Brunton, and Phuong Nguyen</em></td>
<td></td>
</tr>
<tr>
<td>Different Search Patterns and Similar Decision Outcomes: How Can Experts Agree in the Decisions They Make When Reading Digital Mammograms?</td>
<td>212</td>
</tr>
<tr>
<td><em>Claudia Mello-Thoms, Marie Ganott, Jules Sumkin, Christiane Hakim, Cynthia Britton, Luisa Wallace, and Lara Hardesty</em></td>
<td></td>
</tr>
<tr>
<td>Optimization of Tomosynthesis Acquisition Parameters: Angular Range and Number of Projections</td>
<td>220</td>
</tr>
<tr>
<td><em>Thomas Mertelmeier, Jasmina Ludwig, Bo Zhao, and Wei Zhao</em></td>
<td></td>
</tr>
<tr>
<td>Subtle Abnormalities in Highly Dense Breasts Detected by Use of a Digital Phase Contrast Mammography System: A Report of Three Invasive Cancer Cases in the Early Stage</td>
<td>228</td>
</tr>
<tr>
<td><em>Takako Morita, Maya Yamada, Akiko Kano, Sumiya Nagatsuka, Chika Honda, and Tokiko Endo</em></td>
<td></td>
</tr>
<tr>
<td>Image Quality Assessment and Equipment Optimisation with Automated Phantom Evaluation in Full Field Digital Mammography (FFDM)</td>
<td>235</td>
</tr>
<tr>
<td><em>Nadia Oberhofer, Nicoletta Paruccini, and Ehrenfried Moroder</em></td>
<td></td>
</tr>
<tr>
<td>Breast Mass Detection under Increased Ambient Lighting</td>
<td>243</td>
</tr>
<tr>
<td><em>Benjamin J. Pollard, Amarpreet S. Chawla, Noriyuki Hashimoto, and Ehsan Samei</em></td>
<td></td>
</tr>
<tr>
<td>Reducing Noise of Medical Grade Liquid Crystal Displays (LCD) and Its Relation to the Detection of Micro-calculifications</td>
<td>249</td>
</tr>
<tr>
<td><em>Hans Roehrig, Jiahua Fan, William J. Dallas, Elizabeth A. Krupinski, and Jeffrey Johnson</em></td>
<td></td>
</tr>
<tr>
<td>An Ontology to Support Adaptive Training for Breast Radiologists</td>
<td>257</td>
</tr>
<tr>
<td><em>Shanghua Sun, Paul Taylor, Louise Wilkinson, and Lisanne Khoo</em></td>
<td></td>
</tr>
</tbody>
</table>

**Image Analysis and CAD I**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Web Database for Computer-Aided Detection and Diagnosis of Medical Images</td>
<td>265</td>
</tr>
<tr>
<td><em>Dave Tahmoush and Hanan Samet</em></td>
<td></td>
</tr>
<tr>
<td>An Interactive Computer Aided Decision Support System for Detection of Masses in Mammograms</td>
<td>273</td>
</tr>
<tr>
<td><em>Nico Karssemeijer, Andrea Hupse, Maurice Samulski, Michiel Kallenberg, Carla Boetes, and Gerard den Heeten</em></td>
<td></td>
</tr>
</tbody>
</table>
Detection of Masses in Digital Breast Tomosynthesis Mammography:
Effects of the Number of Projection Views and Dose .......................... 279

Heang-Ping Chan, Jun Wei, Yiheng Zhang, Berkman Sahiner,
Lubomir Hadjiiski, and Mark A. Helvie

Effect of Similarity Metrics and ROI Sizes in Featureless Computer
Aided Detection of Breast Masses in Tomosynthesis ......................... 286

Swatee Singh, Georgia D. Tourassi, and Joseph Y. Lo

Knowledge Transfer across Breast Cancer Screening Modalities: A
Pilot Study Using an Information-Theoretic CADe System for Mass
Detection ...................................................................................... 292

Georgia D. Tourassi, Amy C. Sharma, Swatee Singh,
Robert S. Saunders, Joseph Y. Lo, Ehsan Samei, and
Brian P. Harrawood

Gradient Vector Flow Fields and Spiculated Mass Detection in Digital
Mammography Images .................................................................... 299

Fengmei Zou, Yufeng Zheng, Zhendong Zhou, and
Kwabena Agyepong

The Evaluation of Effects on Breast Cancer Diagnoses When Using
Mammographic Semantic Information ............................................. 307

Da Qi, Erika R.E. Denton, Joanna M.E. Leason,
Diaa Othman, and Reyer Zwiggelaar

Computerized Scheme for Focal Asymmetric Densities on Mammograms
by Use of Geometric and Texture Analyses .................................... 315

Shinsuke Katsumura, Hitoshi Futamura, Satoshi Kasai,
Takako Morita, and Tokiko Endo

Identifying Corresponding Lesions from CC and MLO Views Via
Correlative Feature Analysis ....................................................... 323

Yading Yuan, Maryellen Giger, Hui Li, Li Lan, and Charlene Sennett

Image Analysis and CAD II

Case-Specific Reliability Assessment for Improved False Positive
Reduction with an Information-Theoretic CAD System ..................... 329

Piotr A. Habas, Jacek M. Zurada, and Georgia D. Tourassi

Computerized Detection and Classification of Malignant and Benign
Microcalcifications on Full Field Digital Mammograms .................... 336

Lubomir Hadjiiski, Peter Filev, Heang-Ping Chan, Jun Ge,
Berkman Sahiner, Mark A. Helvie, and Marilyn A. Roubidoux

The Effect of Training Sample Size on Performance of Mass
Detection ...................................................................................... 343

Michiel Kallenbog and Nico Karssemeijer
Multiple-Instance Learning Improves CAD Detection of Masses in Digital Mammography ........................................ 350
   Balaji Krishnapuram, Jonathan Stoeckel, Vikas Raykar, Bharat Rao, Philippe Bamberger, Eli Ratner, Nicolas Merlet, Inna Stainvas, Menahem Abramov, and Alexandra Manevitch

Optimizing the CAD Process for Detecting Mammographic Lesions by a New Generation Algorithm Using Linear Classifiers and a Gradient Based Approach .................................................. 358
   Philippe Bamberger, Isaac Leichter, Nicolas Merlet, Eli Ratner, Glenn Fung, and Richard Lederman

Reliability Assessment of Ensemble Classifiers: Application in Mammography ......................................................... 366
   Maciej A. Mazurowski, Jacek M. Zurada, and Georgia D. Tourassi

Breast Mass Classification on Full-Field Digital Mammography and Screen-Film Mammography .................................. 371
   Jiazheng Shi, Berkman Sahiner, Heang-Ping Chan, Lubomir M. Hadjiiski, Jun Ge, and Jun Wei

Detection of Microcalcifications Using a Nonuniform Noise Model ....... 378
   Guido van Schie and Nico Karssemeijer

Modeling and Simulation

The Breast Biomechanics Reference State for Multi-modal Image Analysis ................................................................. 385
   Vijay Rajagopal, Martyn P. Nash, Ralph P. Highnam, and Poul M.F. Nielsen

An Ideal Observer for a Model of X-Ray Imaging in Breast Parenchymal Tissue ......................................................... 393
   Craig K. Abbey and John M. Boone

Statistical Appearance Models of Mammographic Masses ................. 401
   Michael Berks, Steven Caulkin, Rumana Rahim, Caroline Boggis, and Susan Astley

Validation of a Digital Mammography Image Simulation Chain with Automated Scoring of CDMAM Images .................. 409
   Mary Yip, Abdulaziz Alsager, Emma Lewis, Kevin Wells, and Kenneth C. Young

Comparison of Two Methods to Develop Breast Models for Simulation of Breast Tomosynthesis and CT ......................... 417
   J. Michael O'Connor, Mini Das, Clay Didier, Mufeed Mah'D, and Stephen J. Glick
Statistical Deformation Models of Breast Compressions from Biomechanical Simulations .................................................. 426
   C. Tanner, J.H. Hipwell, and D.J. Hawkes

Image Analysis and CAD III

Classification of Benign and Malignant Masses in Ultrasound Breast Image Based on Geometric and Echo Features ........................................ 433
   Gobert N. Lee, Daisuke Fukuoka, Yuji Ikedo, Takeshi Hara, Hiroshi Fujita, Etsuo Takada, Tokiko Endo, and Takako Morita

Validation of Cone-Beam CT Measurements of Tumour Burden Using Three-Dimensional Histopathology: Initial Results for a Lumpectomy ...... 440

A Tool for Temporal Comparison of Mammograms: Image Toggling and Dense-Tissue-Preserving Registration .................................. 447
   Akira Hasegawa, Huzefa Neemuchwala, Hiroko Tsunoda-Shimizu, Satoru Honda, Kazuo Shimura, Minoru Sato, Tomomi Koyama, Mari Kikuchi, and Sonoe Hiramatsu

Development of Whole Breast Ultrasound Viewer and Automated Mass Detection System ...................................................................... 455
   Takeshi Hara, Daisuke Fukuoka, Yuji Ikedo, Etsuo Takada, Hiroshi Fujita, Tokiko Endo, and Takako Morita

Automated Registration of Volumes of Interest for a Combined X-Ray Tomosynthesis and Ultrasound Breast Imaging System .................. 463
   Mitchell M. Goodsitt, Heang-Ping Chan, Lubomir Hadjiiski, Gerald L. LeCarpentier, and Paul L. Carson

Poster Session II

Estimating Individual Cancer Risks in the UK National Breast Screening Programme: A Feasibility Study ........................................ 469
   Jennifer Diffey, Alan Hufton, Susan Astley, Claire Mercer, and Anthony Maxwell

Clinical Performance of Digital Breast Tomosynthesis Versus Full-Field Digital Mammography: Preliminary Results ............................. 477
   Gisella Gennaro, Enrica Baldan, Elisabetta Bezzon, Manuela La Grassa, Luigi Pescarini, and Cosimo di Maggio

Analysis of Anatomical Linear Structure Information in Mammographic Risk Assessment ................................................................. 483
   Edward M. Hadley, Erika R.E. Denton, Josep Pont, Elsa Pérez, and Reyer Zwiggelaar
Evaluating the Effect of Tomosynthesis Acquisition Parameters on Image Texture: A Study Based on an Anthropomorphic Breast Tissue Software Model .................................................. 491

Despina Kontos, Cuiping Zhang, Nicole Ruiter, Predrag R. Bakic, and Andrew D.A. Maidment

Computer Aided Detection (CAD) for Digital Mammography: A Retrospective Reading Study for Consideration on Utilizing CAD Most Effectively ................................................................. 499

Yoshifumi Kuroki, Shigeru Nawano, Seiko Suzuki, Hideya Takeo, and Shigeru Saotome

Does a Mammography CAD Algorithm with Varying Filtering Levels of Detection Marks, Used to Reduce the False Mark Rate, Adversely Affect the Detection of Small Masses? ..................... 504

Isaac Leichter, Richard Lederman, Eli Ratner, Nicolas Merlet, Glenn Fung, Balaji Krishnapuram, and Philippe Bamberger

Performance of CADx on a Large Clinical Database of FFDM Images ........................................................................................................ 510

Hui Li, Maryellen L. Giger, Yading Yuan, Li Lan, and Charlene A. Sennett

Expedited Breast Care: A New Model in Breast Health .................................................. 515


Effect of Using Tungsten-Anode X-Ray Tubes on Dose and Image Quality in Full-Field Digital Mammography .................................................. 522

Jennifer M. Oduko, Kenneth C. Young, Ozcan Gundogdu, and Abdulaziz Alsager

Assessment of Low Energies and Slice Depth in the Quantification of Breast Tomosynthesis .................................................. 530

Christina M. Shafer, Ehsan Samei, Thomas Mertelmeier, Robert S. Saunders, Moustafa Zerhouni, and Joseph Y. Lo

Comparison of Multiple View Strategies to Reduce False Positives in Breast Imaging .................................................. 537

Joerg Teubl and Horst Bischof

Image Correction and Reconstruction for Breast Biopsy .................................................. 545

Meritsell Tortajada, Robert Martí, Jordi Freixenet, Josep Fernández, and Melcior Sentís

Progress Toward a Quantitative Scale for Describing Radiodensity in Mammographic Images .................................................. 553

Christopher Tromans, Sir Michael Brady, Dominique Van de Sompel, Michele Lorenzon, Massimo Bazzocchi, and Chiara Zuiani
Table of Contents

Systematic Performance Analysis of SART as Applied to Digital Breast Tomosynthesis .............................................. 561
   Dominique Van de Sompel and Michael Brady

Optimizing the Target-Filter Combination in Digital Mammography in the Sense of Image Quality and Average Glandular Dose ...................... 570
   Mari Varjonen and Pekka Strömmer

Generic Infrastructure for Medical Informatics (GIMI): The Development of a Mammographic Training System ...................... 577
   Moi Hoon Yap, Alastair G. Gale, and Hazel J. Scott

Evaluation of 3D Breast Surface Reconstruction Accuracy Using Non-contact Scanner Images: A Phantom Study .................... 585
   Cuiping Zhang, Predrag R. Bakic, Shugao Xia, Fengshan Liu, and Andrew D.A. Maidment

Digital Breast Tomosynthesis

Investigation of Different PV Distributions in Digital Breast Tomosynthesis (DBT) Mammography ................................. 593
   Yiheng Zhang, Heang-Ping Chan, Mitchell M. Goodsitt, Andrea Schmitz, Jeffrey W. Eberhard, and Bernhard E.H. Claus

Characterization of Projection Ordering in Iterative Reconstruction Methods for Breast Tomosynthesis ........................ 601
   Gang Wu, James Mainprize, and Martin Yaffe

Effect of Scan Angle and Reconstruction Algorithm on Model Observer Performance in Tomosynthesis ............................ 606
   I. Reiser, B.A. Lau, and R.M. Nishikawa

A Novel Approach for Filtered Backprojection in Tomosynthesis Based on Filter Kernels Determined by Iterative Reconstruction Techniques ... 612
   Jasmina Ludwig, Thomas Mertelmeier, Holger Kunze, and Wolfgang Härer

3D Digital Breast Tomosynthesis Using Total Variation Regularization ................................................................. 621
   Iason Kastanis, Simon Arridge, Alex Stewart, Spencer Gunn, Christer Ullberg, and Tom Francke

Image Artifact in Digital Breast Tomosynthesis and Its Dependence on System and Reconstruction Parameters .............. 628
   Yue-Houng Hu, Wei Zhao, Thomas Mertelmeier, and Jasmina Ludwig
Multi-projection Correlation Imaging as a New Diagnostic Tool for Improved Breast Cancer Detection .................................................. 635
Amarpreet S. Chawla, Ehsan Samei, Joseph Y. Lo, and Thomas Mertelmeier

Sensitivity of Contrast-Enhanced Digital Breast Tomosynthesis to Changes in Iodine Concentration During Acquisition .......................... 643
Melissa L. Hill, James G. Mainprize, and Martin J. Yaffe

Breast Density, Texture and Risk II

Quantifying Breast Thickness for Density Measurement ...................... 651
Jennifer Difffey, Alan Hufston, Christine Beeton, Julia Smith, Tom Marchant, and Susan Astley

Effect of Tissue Thickness Variation in Volumetric Breast Density Estimation ................................................................. 659
Olivier Alonzo-Proulx, Albert H. Tyson, Gordon E. Mawdsley, and Martin J. Yaffe

Breast Abnormality Detection Incorporating Breast Density Information Based on Independent Components Analysis ......................... 667
Styliani Petroudi, Nicoletta Nicolaou, Julius Georgiou, and Michael Brady

Comparison of Breast Percent Density Estimated from Digital Mammograms and Central Reconstructed Tomosynthesis Slice Images ........................................... 674
Predrag R. Bakic, Despina Kontos, Andrea B. Troxel, and Andrew Maidment

Digital Breast Tomosynthesis Parenchymal Texture Analysis for Breast Cancer Risk Estimation: A Preliminary Study .......................... 681
Despina Kontos, Predrag R. Bakic, Andrea B. Troxel, Emily F. Conant, and Andrew D.A. Maidment

Texture Based Segmentation of Breast DCE-MRI ........................................... 689
Yang Can Gong and Michael Brady

Physics, Image Quality and Quality Assurance

Image Quality Measurements in Breast Tomosynthesis ........................ 696
Ruben van Engen, Ramona Bouman, Roeland van der Burght, Barbara Lazzari, David R. Dance, Patrice Heid, Magnus Aslund, and Kenneth C. Young
One Year of Experience with Remote Quality Assurance of Digital Mammography Systems in the Flemish Breast Cancer Screening Program .................................................. 703
  Jurgen Jacobs, Kim Lemmens, Joris Nens, Koen Michielsen,
  Guy Marchal, and Hilde Bosmans

Automatic Exposure Control in Digital Mammography:
Contrast-to-Noise Ratio Versus Average Glandular Dose .......... 711
  Gisella Gennaro, Paola Golinelli, Elena Bellan, Paola Colombo,
  Loredana D’Ercole, Anna Di Nallo, Lara Gallo, Carlo Giordano,
  Gabriele Meliadò, Barbara Morri, Elvina Nassivera,
  Nadia Oberhofer, Daniela Origgi, Massimiliano Paolucci,
  Nicoletta Paruccini, Michela Piergentili, Elisa Rizzi, and
  Raffaella Rossi

Effect of Anode/Filter Combination on the Dose and Image Quality of a Digital Mammography System Based on an Amorphous Selenium Detector ........................................... 716
  Paola Baldelli, Niall Phelan, and Gillian Egan

Comparative Technical Study of Two Generations of CR Plates for Digital Mammography .................................................. 724
  Hilde Bosmans, Kim Lemmens, Jurgen Jacobs,
  Beatrijs Verbrugge, Koen Michielsen, Federica Zanca, Joris Nens,
  Chantal Van Ongeval, and Guy Marchal

Comparing the Performance of Digital Mammography Systems .......... 732
  Kenneth C. Young, Jennifer M. Oduko, Ozcan Gundogdu, and
  Abdulaziz Alsager

Cross-Calibration and Longitudinal Quality Control of Hologic Selenia Full-Field Digital Mammography Systems for Volumetric Breast Density Measurements ........................................ 740
  Jeff Wang, Sergyhei Malkov, Bo Fan, and John Shepherd

Classification of Artifacts in Clinical Digital Mammography .......... 748
  Chantal Van Ongeval, Jurgen Jacobs, André Van Steen,
  Federica Zanca, Hilde Bosmans, and Guy Marchal

Contrast Sensitivity in Mammographic Softcopy
Reading – Determination with Psychophysical Procedures .......... 756
  Dörte Apelt and Heinz-Otto Peitgen

Author Index ............................................................................. 765