Sunday September 6 (HPIR Workshop)

8:30 - 8:40 Welcome

Session 1: Platforms and Optimization
8:40 - 9:05 Hannes G. Hofmann, Benjamin Keck, Christopher Rohkohl, and Joachim Hornegger: Towards C-arm CT Reconstruction on Larrabee.


9:55 - 10:20 Wenyuan Bi, Zhiqiang Chen, Li Zhang, Yuxiang Xing, and Yajie Wang: Real-time Visualize Reconstruction Procedure Using CUDA.

Coffee Break

Session 2: Artifacts and Precision

11:10 - 11:35 Wei Xu, Klaus Mueller: A Performance-Driven Study of Regularization Methods for GPU-Accelerated Iterative CT.

11:35 - 12:00 Clemens Maafi, Sven Steckmann, Matthias Baer, Lars Hillebrand, Willi A. Kalender, and Marc Kachelrieß: CT Image Reconstruction with Half Precision Floating Point Values.

Lunch

Session 3: Algorithms and Accuracy
13:45 - 14:10 Colas Schretter, Christoph Neukirchen, Georg Rose, and Matthias Bertram: Optimal Pre-Filtering for Linear Interpolation in Computed Tomography.

14:10 - 14:35 Fang Xu: Rapid Tomosynthesis with Exact Ray-driven Projector using Graphics Processing Units.

14:35 - 15:00 Xing Zhao, Jingjing Hu, and Peng Zhang: GPU-based Multigrid Iterative algorithm for 3D Cone-Beam CT Image Reconstruction.

15:00 - 15:25 Poster Fast Forward: One Minute - One PPT Slide per Poster

- Junjun Deng, Shikui Yan, and Mu Chen: A fast iterative reconstruction scheme for micro-CT.

- Han Zheng, Yan Kang, Jiren Liu, and Yin Dai: Implementation of Helical Cone-Beam Back-Projection Filtered Reconstruction Algorithm on GPU.

- Simon Rit, Marcel van Herk, and Jan-Jakob Sonke: Fast distance-driven projection and truncation management for iterative cone-beam CT reconstruction.

- Ayako Akazawa, Keishi Kitamura, Yoshihiro Yamada,
Yoshiyuki Yamakawa, Nobuya Hashizume, and Yoshihiko Kumazawa: A GPU Acceleration of List-mode Forward and Back Projections using CUDA. p. 53

- Yajie Wang, Haifeng Hu, and Yuxiang Xing: Strategy for GPU Acceleration of Massive Data Cone Beam CT Reconstruction. p. 57
- Tao Feng, Yajie Wang, Yiming Wang, and Yuxiang Xing: Acceleration of 3D CT Back-projection Based on ATI Stream Computing. p. 61
- Thomas Felder, Moritz Blume, Josep F. Oliver, and Magdalena Rafecas: ML-EM Implementation on a GPU: Avoiding Simultaneous Read-Modify-Write Processes. p. 65
- Changguo Ji, Brendan Vastenhouw, and Freek J. Beekman: Fast U-SPECT-II image reconstruction with multi-core CPUs. p. 69
- Peng Zhang, Defeng Chen, Weiwei Qi, and Huitao Zhang: Reconstruction Algorithm for Multi-Cone-Beam and Its GPU Implementation. p. 73
- D. Vintache, B. Humbert, and D. Brasse: Iterative Reconstruction for Transmission Tomography on GPU using Nvidia CUDA. p. 78

Coffee Break

Session 4: Panel Discussion
15:55 Panel Discussion and Best Paper Award
17:30 Finished
Monday September 7 (Fully 3D Meeting)

Session 0: Welcome
8:10 - 8:40 Opening ceremony

Session 1: Analytical Image Reconstruction (Xiangyang Tang, Emil Sidky)
8:40 - 9:05 Frank Dennerlein, Holger Kunze, and Frederic Noo: Filtered Backprojection Reconstruction with depth-dependent filtering. p. 82
9:05 - 9:30 Dirk Schäfer, Michael Grass: Cone-beam filtered back-projection for circular X-ray tomography with off-center detector. p. 86
9:30 - 9:55 Frederic Noo, Adam Wunderlich, Günther Lauritsch, Hiroyuki Kudo: On the problem of axial data truncation in the reverse helix geometry. p. 90
9:55 - 10:20 Harald Schöndube, Karl Stierstorfer, and Frédéric Noo: Exact efficient handling of interrupted illumination in helical cone-beam CT with arbitrary pitch p. 94

Coffee Break

Session 2: Theory of Image Reconstruction (Jiang Hsieh, Alexander Zamyatin)
10:45 - 11:10 Hao Yan, Xuanqin Mou, Shaojie Tang, Qiong Xu: Improved Scatter Correction in X-Ray Cone Beam CT with Moving Beam Stop Array Using John's Equation. p. 98
11:10 - 11:35 Margo S. Levine, Emil Y. Sidky, and Xiaochuan Pan: Consistency conditions for cone-beam CT data acquired with a straight-line source trajectory. p.102
11:35 - 12:00 Gengsheng L Zeng and Grant T. Gullberg: Exact Iterative Reconstruction for the Interior Problem. p.106

Lunch

Session 3: 4D and Dynamic PET and SPECT Image Reconstruction (Laurent Desbat, Jinyi Qi)
14:10 - 14:35 Nelly Pustelnik, Caroline Chaux, Jean-Christophe Pesquet, Florent C. Sureau, Elodie Dusch, and Claude Comtat: Adapted Convex Optimization Algorithm for Wavelet-Based Dynamic PET Reconstruction. p.114
14:35 - 15:00 Moritz Blume, Axel Martinez-Moller, Andreas Keil, Nassir Navab and Magdalena Rafecas: Joint Reconstruction of Image and Motion in Gated Positron-Emission-Tomography. p.118
15:00 - 15:25 Taek-Soo Lee and Benjamin M. W. Tsui: Optimization of a 4D Space-Time Gibbs Prior in a 4D MAP-RBI-EM Image Reconstruction Method for Application to Gated Myocardial
Coffee Break
Session 4: Poster Session I: Analytical Image Reconstruction, PET (Larry Zeng, Vladimir Panin)
15:55 - 17:50 Poster Session

- Rostyslav Boutchko, Arkadiusz Sitek, and Grant T. Gullberg: Practical aspects of tomographic reconstruction on tetrahedral meshes. p.126
- Fei Gao, Jingjia Xu, Yiqiang Jian, Huafeng Liu, and Pengcheng Shi: Point Clouds Based PET image reconstruction. p.130
- Deepak Bharkhada, Hengyong Yu, Bruno De Man, Ge Wang: Total variation based Cone-beam Reconstruction using Composite-circling Scanning Trajectory. p.134
- Holger Kunzea and Frank Dennerlein: Cone beam reconstruction with displaced flat panel detector. p.138
- Yong Long, Jeffrey A. Fessler, and James M. Balter: A 3D Forward and Back-Projection Method for X-Ray CT Using Separable Footprint. p.146
- Xiangyang Tang: Axial cone beam reconstruction: Can asymptotic extrapolation of trajectory radius be helpful? p.150
- Michael S. Vaz and Russell Mersereau: On Filter Design for CT Reconstruction. p.154
- Baodong Liu, and Li Zeng: POCS Algorithm for 3D Exterior CT with Prior Knowledge. p.162
- Xiaobing Zou, and Li Zeng: Katvich-type algorithm for dual helcial cone-beam CT. p.166
- Dan Xia, Seungryong Cho, and Xiaochuan Pan: Backprojection filtration algorithm with improved noise properties for a circular cone-beam CT. p.170
- Michael S. Vaz, Russell Mersereau, Guillaume Spalla, Cédric Marchessoux: CT Reconstruction from Truncated Scans. p.178
- Han Wang, Samuel Legoupil, and Laurent Desbat: 2D X-Ray Tomographic Reconstruction From Few Number of Projections And 3D Perspectives: Applications of
Compressed Sensing Theory. p.186

• Yannick Grondin, Laurent Desbat, and Michel Desvignes: Sampling in cylindrical 2D PET. p.191

• Colas Schretter: Online PET Reconstruction From List-Mode Data. p.195

• Christophe Cloquet, Florent Sureau, Michel Defrise, Gaëtan Van Smaeys, Nicola Trotta, and Serge Goldman: Space-variant resolution modelling for list-mode reconstruction on the Philips Gemini 16 Power. p.199


• Éric Barat, Claude Comtat, Thomas Dautreme, Thierry Montagu, Mame Diarra Fall, Ali Mohammad Djaafari, and Régine Trébossen: Nonparametric Bayesian Spatial Reconstruction for Positron Emission Tomography. p.207

• Bing Bai, J. John Mann, and Ramin V. Parsey: Calculation of Region-of-Interest Value and Noise Properties of 3DRP Images. p.211

Meeting Adjourn
Tuesday September 8 (Fully 3D Meeting)

Session 5: PET Image Reconstruction (Ronald Huesman, Samuel Matej)
8:30 - 8:55 Jian Zhou, Sara St. James, Simon Cherry, Jinyi Qi: *Adaptive 3D PET Imaging using a High-Resolution Detector.* p.215
9:45 - 10:00 Scott D. Metzler, Ahmet S. Ayan, Roberto Accorsi, Samuel Matej, Joel S. Karp: *PET Collimation to Improve Spatial Resolution and Sampling.* p.227

Coffee Break

Session 6: CT Image Reconstruction (Frédéric Noo, Jean-Baptiste Thibault)
10:40 - 11:05 Junguo Bian, Xiao Han, Emil Y. Sidky, Daniel Tward, Jeffrey H. Siewersden, Xiaochuan Pan: *Sparse-data Reconstruction in Flat-panel Cone-beam CT for Potential Use in Image-guided Surgery.* p.231

Lunch

Session 7: Iterative CT Image Reconstruction (Michel Defrise, Thomas Koehler)
13:45 - 14:10 Kai Zeng, Bruno De Man, and Jean-Baptiste Thibault: *Correction of Iterative Reconstruction Artifacts in Helical Cone-Beam CT.* p.242
14:10 - 14:35 Jingyan Xu, Katsuyuki Taguchi, Benjamin M.W. Tsui: *Statistical projection completion in x-ray CT using consistency conditions.* p.246
14:35 - 15:00 Wei Xu and Klaus Mueller: *Learning Effective Parameter Settings for Iterative CT Reconstruction Algorithms.* p.251

Coffee Break

Session 8: Poster Session II: CT and SPECT Image Reconstruction (Marc Kachelriess, Freek Beekman)
15:25 - 17:10 Poster Session
• Synho Do, Sanghee Cho, W. Clem Karl, Mannudeep K. Kalra, Thomas J. Brady, and Homer Pien: CT system response models in iterative reconstruction algorithms for low-dose imaging. p.259

• Thomas Köhler and Roland Proksa: Noise Properties of Maximum Likelihood Reconstruction with Edge-Preserving Regularization in Transmission Tomography. p.263

• Herbert Bruder, Rainer Raupach, Johan Sunnegårdh, Martin Sedlmair, Heinrich Wallschläger, Karl Stierstorfer, Thomas Flohr: A New Class of Regularization Priors for Iterative Reconstruction in Cone-Beam CT. p.267

• Clemens Maas and Marc Kachelrieß: Material Decomposition with Inconsistent Rays (MDIR) for Cone-Beam Dual Energy CT. p.271

• Hui Xue, Li Zhang, Yongshun Xiao, and Zhiqiang Chen: Metal Artifact Reduction by Sinogram TV Inpainting in Dual Energy Computerized Tomography. p.276

• Yuanyuan Liu, Zhiqiang Chen, Li Zhang, Yuxiang Xing, Jianping Cheng, Zhentian Wang: Dual Energy CT Reconstruction Method with Reduced Data. p.280


• Kjell Erlandsson, Brian F Hutton: Partial volume correction in SPECT using anatomical information and iterative FBP. p.287

• Chao Wu, Frans van der Have, Brendan Vastenhouw, Rudi Dierckx, Anne Paans, and Freek Beekman: Absolute Quantitative Focusing Pinhole SPECT. p.291

• Bing Feng: Calibration of a Multi-Pinhole SPECT System without Pre-Knowledge of Point-Source Markers' 3D Coordinates. p.295

• Ho-Hui Hsieh, Ing-Tsung Hsiao: Image Reconstruction for A Stationary Multi-pinhole SPECT System. p.299

• Anne C. Sauve, Bryan W. Reutter and Grant T. Gullberg: Fully 3D SPECT Attenuation and Scatter Correction Using Monte Carlo Generated System Matrices. p.303

• Chuanyong Bai, Hetal Babla, and Richard Conwell: Emission-Based Scatter Correction in SPECT Imaging. p.307

• Tianyu Ma, Yinbin Miao, Rutao Yao, Tiantian Dai, and Xiao Deng: Quantitative Accuracy Assessment and Optimization of SPECT Geometrical Calibration. p.312

• Xiao Deng, Tianyu Ma, and Rutao Yao: Determination of the Septa-to-crystal Position in Axial Direction for a Silt-Slat Collimator SPECT. p.316

Meeting Adjourn
Wednesday September 9 (Fully 3D Meeting)

Session 9: 4D CT Image Reconstruction (Xiaochuan Pan, Katsuyuki Taguchi)

8:30 - 8:55 Andreas Keil, Jakob Vogel, Gunter Lauritsch, and Nassir Navab: Dynamic Cone-Beam Reconstruction Using a Variational Level Set Formulation. p.319

8:55 - 9:20 Christopher Rohkohl, Gunter Lauritsch, Marcus Prümmer, Jan Boese and Joachim Hornegger: Towards 4-D Cardiac Reconstruction without ECG and Motion Periodicity using C-arm CT. p.323

9:20 - 9:45 Colas Schretter, Fabian Pilatus, Georg Rose, Til Aach and Matthias Bertram: Optical Flow Motion Estimation for Approximate Motion Compensation in Cone-Beam CT. p.327

9:45 - 10:10 Thomas Köhler, Tobias Klinder, Udo van Stevendaal, Cristian Lorenz, Peter Forthmann: Correction of Breathing-Induced Rib Cage Motion in Helical CT. p.331

Coffee Break

Session 10: Time-of-Flight PET Image Reconstruction (Arkadiusz Sitek, Xuan Liu)

10:40 - 11:05 Michel Defrise, Vladimir Panin, Florent Sureau, Monica Abella, and Mike Casey: An exact axial rebinning method for time-of-flight PET. p.335


11:30 - 11:55 V. Y. Panin and M. Defrise: 3D TOF PET Forward Projector Based on the Exact Axial Rebinning Relation in Fourier Space. p.343

Lunch

Session 11: SPECT Image Reconstruction (Grant Gullberg, Yuxiang Xing)

13:45 - 14:10 Woutjan Branderhorst, Brendan Vastenhouw, and Freek J. Beekman: Improved subset choice for block-iterative multi-pinhole SPECT reconstruction. p.347


14:35 - 15:00 Gengsheng L. Zeng, Eric Hawman: Stationary Multi-Divergent-Beam or Multi-Slant-Parallel-Beam Cardiac SPECT. p.354

15:00 - 15:25 Qiu Huang, Tsutomu Zeniya, Hiroyuki Kudo, Hidehiro Iida, and Grant T. Gullberg: Interior SPECT Reconstruction Problem with Tiny a priori Knowledge – An Application for High Resolution Pinhole Brain Imaging. p.358

Coffee Break
Session 12: Poster Session III: 4D CT, PET and SPECT imaging
Reconstruction and Other Topics (Günter Lauritsch, Jerome Liang)
15:55 - 17:10 Poster Session

- Xin Jin, Liang Li, Zhiqiang Chen, Li Zhang, Yuxiang Xing: Motion Tomography on Multiple Moving Objects. p.362
- Katsuyuki Taguchi and Hideaki Tashima: Comparison of analytical motion compensated cone-beam reconstruction algorithms for x-ray computed tomography. p.366
- Yin Xue-Min, Yan Lei: Simultaneous super-resolution restoration and motion estimation based on bayesian framework with total variation. p.369
- Si Chen and Benjamin M.W. Tsui: Four-Dimensional OS-EM PET Image Reconstruction Method with Motion Compensation. p.373
- Yi Fan, Hongbing Lu, and Zhengrong Liang: A Fully Four Dimensional Reconstruction Strategy for Cardiac Gated SPECT with Noise Reduction, Scatter Correction, Resolution Restoration and Inversion of Attenuated Radon Transform in KL Space. p.377
- Shaojie Tang, Xuanqin Mou, Qiong Xu, Hao Yan, Junfeng Wu, Yanbo Zhang, Hengyong Yu: Noise Reduction by Projection Direction Dependent Diffusion for Low Dose X-Ray Cone Beam Computed Tomography. p.381
- Seungryong Cho, Dan Xia, Erik Pearson, Charles A. Pelizzari, and Xiaochuan Pan: Half-fan-based Region-of-interest Imaging in Circular Cone-beam CT for Radiation Therapy. p.385
- Jie Tang, Jiang Hsieh, and Guang-Hong Chen: Temporal Resolution Improvement using PICCS in MDCT Cardiac Imaging. p.398
- Min Yang, Yimin Yang, Chunmei Han, Gang Wang, and Wenjin Wu: Research on 3-D Information Acquisition of Micro Drilling Marks on Ancient Perforated Bead by Micro-CT. p.402
- Xuan Liu, Alexander Sasov and Peter Bruyndonckx: An EM reconstruction algorithm for microXRF. p.406
- Junguo Bian, Xiao Han, Emil Y. Sidky, Guohua Cao, Jianping Lu, Otto Zhou, and Xiaochuan Pan: Investigation of Sparse-data Mouse Imaging Using Micro-CT with a Carbon
Nanotube X-ray Source. p.410

• Yan Xi, Jun Zhao and Ge Wang: A Reconstruction Method for Helical Interlaced-source-detector-array CT. p.414


• William Hawkins: Backscatter Tomography. p.422

• Rongchang Chen, Honglan Xie, Luigi Rigon, Guohao Du, Edoardo Castelli, and Tiqiao Xiao: Phase contrast micro-computed tomography of biological sample at SSRF. p.426


• Jian Zhou and Jinyi Qi: High-Resolution Adaptive PET Imaging. p.434

Meeting Adjourn
Thursday September 10 (Fully 3D Meeting)

Session 13: Other Topics (Ge Wang, Peng Zhang)


8:55 - 9:20 Xiao Han, Junguo Bian, Diane R. Eaker, Emil Y. Sidky, Erik L. Ritman, and Xiaochuan Pan: Image reconstruction of Animal Vasculature from Undersampled Circular Cone-beam Micro-CT data. p.442

9:20 - 9:45 Zhifeng Huang, Li Zhang, Zhentian Wang, Zhiqiang Chen, and Kejun Kang: Grating-based Multiple Information Computed Tomography. p.446

Coffee Break

10:10 - 11:10 Close Ceremony, Fully3d2011 Announcement

11:10 - 13:30 Farewell Lunch

Tour