Conference 5299

Monday-Tuesday 19-20 January 2004 • Proceedings Vol. 5299

Computational Imaging II

Conference Chairs: **Charles A. Bouman**, Purdue Univ.; **Eric L. Miller**, Northeastern Univ.

Program Committee: **Edmund Y. Lam**, Univ. of Hong Kong (Hong Kong); **Robert L. Stevenson**, Univ. of Notre Dame

Monday 19 January

SESSION 1 . . . . . Mon. 8:30 to 9:50 am

Physics-Based Inverse Methods I

Error study in neural source localization, Y. Sun, Purdue Univ. . . . . [5299-01]

Use of the FDTD method for time reversal: application to microwave breast cancer detection, P. Kosmas, C. Rappaport, Northeastern Univ. . . . . [5299-02]

Statistical performance characterization, limits, and optimization for the use of diffuse optical tomography in breast cancer detection and diagnosis, E. L. Miller, G. L. Boverman, Northeastern Univ.; D. Boas, Massachusetts General Hospital [5299-03]

Representing scattering functions with spherical harmonics of spectral Fourier components, Y. Sun, Purdue Univ. . . . . [5299-04]

SESSION 2 . . . . . Mon. 10:20 to 11:10 am

Temporal Imaging

Estimation of kinetic model parameters in optical diffusion tomography, A. B. Milstein, S. Oh, K. J. Webb, C. A. Bouman, Purdue Univ. . . . . [5299-05]

Recursive estimation methods for tracking of localized perturbations in absorption and scattering using diffuse optical tomography, E. L. Miller, A. L. Hamdi, Northeastern Univ.; D. Keesing, M. Kilmer, Tufts Univ.; M. A. Franceschini, D. Boas, Massachusetts General Hospital . . . . . [5299-06]

Reconstruction of image sequences using motion compensation, Y. Yang, E. Gravier, Illinois Institute of Technology . . . . . [5299-07]

SESSION 3 . . . . . Mon. 11:10 am to 12:10 pm

Physics-Based Inverse Methods II

Computational algorithm for reconstructing the profile of 2D rough surfaces, S. Nguyen, M. El-Shenawee, Univ. of Arkansas; E. L. Miller, Northeastern Univ.[5299-08]

Imaging multiple physical parameters in an inverse problems context, E. L. Miller, Northeastern Univ.; N. Baddour, Univ. of Toronto (Canada); Y. L. Fei, Northeastern Univ.; A. Mandelis, Univ. of Toronto (Canada) . . . . . [5299-09]

Noise reduction and 3D visualization of confocal microscopy images, Y. Sun, Purdue Univ. . . . . [5299-46]

Lunch Break

SESSION 4 . . . . . Mon. 1:40 to 5:30 pm

Computational Image Processing

Color filter array design based on a human visual model, M. Parmar, S. J. Reeves, Auburn Univ. . . . . [5299-10]

Inverting color transforms, M. R. Gupta, Univ. of Washington . . . . . [5299-11]

Restoration of images with optical aberrations and quantization in a transform domain, E. Y. Lam, M. K. Ng, Univ. of Hong Kong . . . . . [5299-12]

Optimal unsharp mask for image sharpening and noise removal, S. H. Kim, Samsung Electronics Co., Ltd. (South Korea) and Purdue Univ.; J. P. Allebach, Purdue Univ. . . . . [5299-13]

Computational imaging in automated analysis of mammograms, E. J. Delp III, Purdue Univ. . . . . [5299-14]

Image modeling: new perspective for image processing and computer vision, D. Ziou, Univ. de Sherbrooke (Canada); M. Allili, Bishop's Univ. (Canada) . . . . [5299-15]

Likelihood term in restoration of transform-compressed imagery, M. A. Robertson, Air Force Research Lab. . . . . [5299-16]

Bayesian approach to filter design detection of compact sources, J. L. Sanz, D. Herranz, P. Vielva, E. Martinez-Gonzalez, R. B. Barreiro, M. Lopez-Caniego, Univ. de Cantabria (Spain) . . . . . [5299-43]

Design and optimization of computational imaging systems, E. R. Dowski, Jr., K. Kubala, CDM Optics, Inc. . . . . [5299-17]

Applications of wavefront coded imaging systems, R. Narayanswamy, CDM Optics, Inc. . . . . [5299-18]

Tuesday 20 January

Plenary Presentation . . . . . 8:30 to 9:15 am

Digital Printing: An Image Processor's Perspective

Jan P. Allebach, Purdue Univ.

See pg. 6 for details.

SESSION 5 . . . . . Tues. 9:30 to 11:10 am

Image Modeling

Optimizing knot positions for multidimensional B-spline models, X. Deng, T. S. Denney, Jr., Auburn Univ. . . . . [5299-19]

Inverse problems in computational biology, P. C. Doerschuk, Purdue Univ. [5299-20]

Time-frequency analysis with best local cosine bases, Y. Huang, C. A. Bouman, I. Pollak, Purdue Univ. . . . . [5299-21]

Bounded variation type image reconstruction, B. J. Lucier, Purdue Univ.; A. Chambolle, Univ. Paris Dauphine (France) . . . . . [5299-22]

SESSION 6 . . . . . Tues. 11:10 am to 12:30 pm

Multigrid Processing Methods

Grouping and segmentation in a hierarchy of graphs, W. G. Kropatsch, Y. Haxhimusa, Technicshe Univ. Wien (Austria) . . . . . [5299-44]

Graph pyramids as models of human problem solving, Z. Pizlo, Z. Li, Purdue Univ. . . . . [5299-45]

Multigrid inversion with variable resolution data and parameter spaces, S. Oh, A. B. Milstein, C. A. Bouman, K. J. Webb, Purdue Univ. . . . . [5299-23]

Alternating minimization multigrid algorithms for transmission tomography, J. A. O'Sullivan, J. Benac, Washington Univ. . . . . [5299-24]

Lunch/Exhibition Break

SESSION 7 . . . . . Tues. 2:00 to 3:20 pm

Registration and Mosaicing

Multiframe demosaicing of under-sampled color images, S. Farsiu, Univ. of California/Santa Cruz; M. Elad, Technion—Israel Institute of Technology (Israel); P. Milanfar, Univ. of California/Santa Cruz . . . . . [5299-25]

Linear models for multi-frame super-resolution restoration under non-affine registration and spatially varying PSF, S. Borman, R. L. Stevenson, Univ. of Notre Dame . . . . . [5299-26]

High-resolution video mosaicing for documents and photos by estimating camera motion, T. Sato, Nara Institute of Science and Technology (Japan) and NEC Labs. (Japan); S. Ikeda, Nara Institute of Science and Technology (Japan); M. Kanbara, Nara Institute of Science and Technology (Japan) and NEC Labs. (Japan); A. Iketani, N. Nakajima, NEC Labs. (Japan); N. Yokoya, Nara Institute of Science and Technology (Japan) and NEC Labs. (Japan); K. Yamada, NEC Labs. (Japan) . . . . . [5299-27]

Mobile robot control for composition of seamless and high-resolution images in library, R. Ueda, Univ. of Tokyo (Japan) and Hitachi, Ltd. (Japan); T. Moriya, Hitachi, Ltd. (Japan); C. Trevai, Univ. of Tokyo (Japan) and Hitachi, Ltd. (Japan); T. Arai, Univ. of Tokyo (Japan) . . . . . [5299-28]

SESSION 8 . . . . . Tues. 3:40 to 5:40 pm

Geometric Inversion

Color feature and density-based image mosaicing using repeated application of the ICP algorithm, S. H. Chang, J. Fuller, A. Farsaie, L. Elkins, Spatial Integrated Systems, Inc. . . . . [5299-29]

Shape distributions as priors for image segmentation, A. V. Litvin, W. C. Karl, Boston Univ. . . . . [5299-30]

Statistical-model based identification of complete vessel-tree frames in coronary angiograms, T. Aach, A. P. Condurache, Univ. zu Lübeck (Germany); K. Eck, J. Bredno, Philips Research Labs. (Germany) . . . . . [5299-31]

Shape reconstruction of flexible objects from monocular images for industrial applications, M. M. Ellenrieder, DaimlerChrysler AG (Germany) . . . . . [5299-32]

New flexible parameterization for the estimation of 3D shape structure from scattered field data, E. L. Miller, B. L. Tarokh, Northeastern Univ.; D. Boas, Massachusetts General Hospital . . . . . [5299-33]

Subspace-based analysis of the ERT inverse problem, E. L. Miller, M. Khames, Northeastern Univ. . . . . [5299-34]

✔ Posters-Tuesday

Posters will be placed on display after 9:00 am in San Jose Marriott: San Jose Ballroom. A poster session, with authors present at their posters, will be held Tuesday evening, 5:30 to 7:00 pm.

✔ **Computational image processing for a computer vision system using biomimetic sensors and Eigenspace object models,** C. H. G. Wright, S. F. Barrett, Univ. of Wyoming; D. J. Pack, M. J. Wilcox, U.S. Air Force Academy . . . . . [5299-35]

✔ **Automatic road extraction based on cross detection in suburb,** G. Koutaki, K. Uchimura, Kumamoto Univ. (Japan) . . . . . [5299-36]

✔ **Performance analysis of color spaces for optimally fitting the active shape model,** S. Kim, J. Kang, J. Jung, J. Shin, J. Paik, Chung-Ang Univ. (South Korea) . [5299-37]

✔ **Global computational algebraic topology approach for diffusion,** M. Auclair-Fortier, D. Ziou, Univ. de Sherbrooke (Canada); M. Allili, Bishop's Univ. (Canada) . . . . . [5299-38]

✔ **Adaptive Wiener filtering for image restoration using wavelet packets,** J. Zhang, Beijing Institute of Technology (China) . . . . . [5299-39]

✔ **Dynamic region-of-interest acquisition and face tracking for intelligent surveillance system,** Y. Kim, Korea Electronics Technology Institute (South Korea) and Chung-Ang Univ (South Korea); C. Park, Korea Electronics Technology Institute (South Korea); S. Kim, J. Paik, Chung-Ang Univ. (South Korea) . [5299-40]

✔ **Frame interpolation of ultrasound images using optical flow,** T. Nam, R. Park, Sogang Univ. (South Korea) . . . . . [5299-41]

✔ **Image denoising via fundamental anisotropic diffusion and wavelet shrinkage: a comparative study,** B. Bayraktar, Purdue Univ.; M. Analoui, Pfizer Inc. . [5299-42]