
Wavelets XIII

Conference 7446 - Proceedings of SPIE Volume 7446

Dates: **Sunday-Tuesday 2 - 4 August 2009**

Part of program track on

[Image and Signal Processing](#)

Conference Chairs

Vivek K. Goyal, Massachusetts Institute of Technology; **Manos Papadakis**, Univ. of Houston; **Dimitri Van de Ville**, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Sunday 2 August

Welcome

Date: **Sunday 2 August**

Time: **8:40 AM - 8:50 AM**

Session Chair: **Vivek K. Goyal**, Massachusetts Institute of Technology

Session 1: Wavelets in Bio-Imaging

Date: **Sunday 2 August**

Time: **8:50 AM - 10:10 AM**

Session Chairs: **Amina Chebira**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Michael Liebling**, Univ. of California, Santa Barbara; **Jean-Christophe Olivo-Marin**, Institut Pasteur (France)

Wavelet domain mutual information synchronization of multi-modal cardiac microscopy image sequences

Paper 7446-3

Author(s): Michael Liebling, Hiranmayi Ranganathan, Univ. of California, Santa Barbara (United States)

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Multiresolution multiscale active mask segmentation of fluorescence microscope images

Paper 7446-4

Author(s): Gowri Srinivasa, PES School of Engineering (India); Matthew C. Fickus, Air Force Institute of Technology (United States); Jelena Kovacevic, Carnegie Mellon Univ. (United States)

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Sparse algebraic reconstruction for Fluorescence Mediated Tomography

Paper 7446-5

Author(s): Arrate Muñoz-Barrutia, Carlos Pardo-Martin, Thomas Pengo, Carlos Ortiz-de-Solórzano, Univ. de Navarra

(Spain)

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Compressed sensing in biological microscopy

Paper 7446-6

Author(s): Marcio de Moraes Marim, Institut Pasteur (France); Elsa D. Angelini, Ecole Nationale Supérieure des Télécommunications (France); Jean-Christophe Olivo-Marin, Institut Pasteur (France)

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Session 2: Compressed Sensing and its Applications

Date: **Sunday 2 August**

Time: **10:40 AM - 12:00 PM**

Session Chair: **Justin K. Romberg**, Georgia Institute of Technology

Multiple channel estimation and compressive sensing

Paper 7446-7

Author(s): Justin K. Romberg, Georgia Institute of Technology (United States)

No abstract available

A sparsity detection framework for on-off random access channels

Paper 7446-8

Author(s): Alyson K. Fletcher, Univ. of California, Berkeley (United States); Sundeep Rangan, Flarion Technologies, Inc. (United States); Vivek K. Goyal, Massachusetts Institute of Technology (United States)

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Sparse approximation methods for wireless source localization

Paper 7446-9

Author(s): Andrew E. Waters, Volkan Cevher, Richard G. Baraniuk, Rice Univ. (United States)

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Optimal algorithms for support recovery

Paper 7446-10

Author(s): Venkatesh Saligrama, Boston Univ. (United States)

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Lunch Break 12:00 PM -

Session 3: Directional Multidimensional Data Representations

Date: **Sunday 2 August**

Time: **1:30 PM - 3:10 PM**

Session Chair: **Demetrio Labate**, North Carolina State Univ.

Three-dimensional steerlets: a novel tool for extracting textural and structural features in 3D images

Paper 7446-11

Author(s): Manos Papadakis, Robert Azencott, Bernhard G. Bodmann, Univ. of Houston (United States)

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Digital shearlet transform

Paper 7446-12

Author(s): Gitta Kutyniok, Univ. Osnabrück (Germany); David L. Donoho, Morteza Shahram, Stanford Univ. (United States)

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Inverse half-toning using a shearlet representation

Paper 7446-13

Author(s): Glenn R. Easley, System Planning Corp. (United States); Vishal Patel, Dennis M. Healy, Jr., Univ. of Maryland, College Park (United States)

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Signal restoration with overcomplete wavelet transforms: comparison of analysis and synthesis priors

Paper 7446-14

Author(s): Ivan W. Selesnick, Polytechnic Institute of NYU (United States); Mario A. T. Figueiredo, Instituto Superior Técnico (Portugal)

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A curve representation of human behavior

Paper 7446-15

Author(s): Sheng Yi, Hamid Krim, North Carolina State Univ. (United States)

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Session 4: Sparsity in Physics

Date: **Sunday 2 August**

Time: **3:40 PM - 5:20 PM**

Session Chairs: **Pierre Vandergheynst**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Yves Wiaux**, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Sparsity and persistence in time-frequency sound representations

Paper 7446-16

Author(s): Bruno Torrèsani, Matthieu Kowalski, Univ. de Provence (France)

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Efficient analysis and representation of geophysical processes using localized basis functions

Paper 7446-17

Author(s): Frederik J. Simons, Jessica C. Hawthorne, Dong V. Wang, Princeton Univ. (United States)

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Wavelets, sparsity and SLEs in fluids and plasmas: examining the coexistence of coherent structures and random, locally scale invariant multifractality (Canceled)

Paper 7446-18

Author(s): Bedros Afeyan, Polymath Research Inc. (United States); Jean-Luc Starck, Commissariat à l'Énergie Atomique (France); Ilya Gruzberg, The Univ. of Chicago (United States); Peter Jones, Yale Univ. (United States); George R. McKee, Jr., Univ. of Wisconsin-Madison (United States); C. Frederick Driscoll, Univ. of California, San Diego (United States)

No abstract available

Compressed sensing and the ESA Herschel Project

Paper 7446-19

Author(s): Jerome Bobin, California Institute of Technology (United States); Jean-Luc Starck, Marc Sauvage, Commissariat à l'Énergie Atomique (France); N. Barbey,

No abstract available

Compressed sensing for radio interferometry: spread spectrum imaging techniques

Paper 7446-20

Author(s): Yves Wiaux, Ecole Polytechnique Fédérale de Lausanne (Switzerland) and Univ. Catholique de Louvain (Belgium); Gilles Puy, Y. Boursier, Pierre Vandergheynst, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Symposium-wide Plenary Session

Date: **Sunday 2 August**

Time: **6:00 PM - 7:30 PM**

Four Hundred Years through the Eye of the Telescope

Jerry Nelson, Univ. of California, Santa Cruz (USA)

Peering into the Explosion: Using Stellar Archaeology to Unlock the Mysteries of Supernovae

Tracey Delaney, MIT Kavli Institute for Astrophysics and Space Research (USA)

Monday 3 August

Session 5: Frames: Theory and Applications

Date: **Monday 3 August**

Time: **8:30 AM - 10:30 AM**

Session Chairs: **Radu V. Balan**, Univ. of Maryland, College Park; **Bernhard G. Bodmann**, Univ. of Houston

Duals of frame sequences

Paper 7446-21

Author(s): Christopher E. Heil, Yoo Young Kim, Georgia Institute of Technology (United States); Jae Kun Lim, Hankyong National Univ. (Korea, Republic of)

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A family of GU equiangular tight frames

Paper 7446-22

Author(s): Kasso A. Okoudjou, Univ. of Maryland, College Park (United States)

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Lapped tight frame transforms

Paper 7446-23

Author(s): Aliaksei Sandryhaila, Carnegie Mellon Univ. (United States); Amina Chebira, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Markus Pueschel, Jelena Kovacevic, Carnegie Mellon Univ. (United States)

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Distribution of quantization noise

Paper 7446-24

Author(s): Yang Wang, Michigan State Univ. (United States)

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Signal reconstruction with erasures

Paper 7446-25

Author(s): Peter G. Casazza, Steven Senger, Univ. of Missouri, Columbia (United States); Bernhard G. Bodmann, Univ. of Houston (United States); Gitta Kutyniok, Univ. Osnabrück (Germany)

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Nested frames as fountain codes

Paper 7446-26

Author(s): Gitta Kutyniok, Univ. Osnabrück (Germany); Bernhard G. Bodmann, Univ. of Houston (United States); Ali Pezeshki, Colorado State Univ. (United States)

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Keynote I

Date: **Monday 3 August**

Time: **11:00 AM - 12:00 PM**

Session Chair: **Dimitri Van De Ville**, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Compressed Sensing: what works, what doesn't, and what's still in store

Paper 7446-1

Author(s): Thomas Strohmer, Univ. of California, Davis (United States)

No abstract available

Lunch/Exhibition Break 12:00 PM -

Session 6: Design of Overcomplete Multidimensional Decompositions

Date: **Monday 3 August**

Time: **1:30 PM - 3:10 PM**

Session Chair: **Nicholas G. Kingsbury**, Univ. of Cambridge (United Kingdom)

Optimality in the design of overcomplete decompositions

Paper 7446-27

Author(s): Nicholas G. Kingsbury, Univ. of Cambridge (United Kingdom); H. Joel Trussell, North Carolina State Univ. (United States)

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Learning real and complex overcomplete representations from the statistics of natural images

Paper 7446-28

Author(s): Bruno A. Olshausen, Charles F. Cadieu, Univ. of California, Berkeley (United States); David K. Warland, Univ. of California, Davis (United States)

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Gabor wavelet analysis and the fractional Hilbert transform

Paper 7446-29

Author(s): Kunal N. Chaudhury, Michael A. Unser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Solving inverse problems with overcomplete transforms and convex optimization techniques

Paper 7446-30

Author(s): Lotfi Chaâri, Nelly Pustelnik, Caroline Chaux, Jean-Christophe Pesquet, Univ. Paris-Est Marne-la-Vallée (France)

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Oscillatory and transient signal decomposition using overcomplete rational-dilation wavelet transforms

Paper 7446-31

Author(s): Ivan W. Selesnick, Ilker Bayram, Polytechnic Institute of NYU (United States)

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Session 7: Wavelet Constructions and Applications

Date: **Monday 3 August**
Time: **3:40 PM - 5:20 PM**

Session Chair: **Manos Papadakis**, Univ. of Houston

Wavelet primal sketch representation using Marr wavelet pyramid and its reconstruction

Paper 7446-32

Author(s): Dimitri Van De Ville, Michael A. Unser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Texture synthesis using Marr wavelet pyramid

Paper 7446-33

Author(s): Dimitri Van De Ville, Matthieu Guerquin-Kern, Michael A. Unser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Self-similar random vector fields and their wavelet analysis

Paper 7446-34

Author(s): Pouya D. Tafti, Michael A. Unser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Monogenic wavelet frames

Paper 7446-35

Author(s): Stefan Held, Martin Storath, Technische Univ. München (Germany)

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Dual frame symmetric wavelets with limited redundancy

Paper 7446-36

Author(s): Farras Abdelnour, Univ. of Pittsburgh Medical Ctr. (United States)

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Tuesday 4 August

Session 8: From Frames to Fusion Frames

Date: **Tuesday 4 August**
Time: **8:30 AM - 10:30 AM**

Session Chairs: **Peter G. Casazza**, Univ. of Missouri, Columbia; **Gitta Kutyniok**, Univ. Osnabrück (Germany)

Stable subspace splittings and fusion frames

Paper 7446-37

Author(s): Peter Oswald, Jacobs Univ. Bremen (Germany)

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Parseval fusions frames

Paper 7446-38

Author(s): Robert A. Calderbank, Princeton Univ. (United States); Peter G. Casazza, Univ. of Missouri, Columbia (United States); Gitta Kutyniok, Univ. Osnabrück (Germany); Ali Pezeshki, Colorado State Univ. (United States)

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Constructing tight fusion frames

Paper 7446-39

Author(s): Peter G. Casazza, Univ. of Missouri, Columbia (United States); Matthew C. Fickus, Air Force Institute of Technology (United States); Yang Wang, Zhenfang Zhou, Michigan State Univ. (United States)

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Compressed sensing for fusion frames

Paper 7446-40

Author(s): Petros T. Boufounos, Rice Univ. (United States); Gitta Kutyniok, Univ. Osnabrück (Germany)

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Discriminative ℓ_k -metrics

Paper 7446-41

Author(s): Arthur Szlam, Univ. of California, Los Angeles (United States); Guillermo Sapiro, Univ. of Minnesota (United States)

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When are frames close to equal-norm Parseval frames?

Paper 7446-42

Author(s): Bernhard G. Bodmann, Univ. of Houston (United States); Peter G. Casazza, Univ. of Missouri, Columbia (United States)

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Keynote II

Date: **Tuesday 4 August**

Time: **11:00 AM - 12:00 PM**

Session Chair: **Manos Papadakis**, Univ. of Houston

Sparsity on the prowl: extending further into the real world

Paper 7446-2

Author(s): Onur G. Guleryuz, DoCoMo Communications Labs. USA, Inc. (United States)

No abstract available

Session 9: Wavelet-aided Inference

Date: **Tuesday 4 August**

Time: **1:30 PM - 2:30 PM**

Session Chair: **Vivek K. Goyal**, Massachusetts Institute of Technology

Classification of hyperspectral colon tissue samples using MCMC with wavelet transforms

Paper 7446-43

Author(s): Khalid Masood, Nasir M. Rajpoot, Irfan T. Butt, The Univ. of Warwick (United Kingdom); Muhammad Yousaf, The Univ. of Texas at Arlington (United States)

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Reliable structural information from multi-scale decomposition with the Mellor-Brady filter

Paper 7446-44

Author(s): Tuende Szilagyi, J. Michael Brady, Univ. of Oxford (United Kingdom)

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Poisson denoising on the sphere

Paper 7446-45

Author(s): Jérémy Schmitt, Jean-Luc Starck, Commissariat à l'Énergie Atomique (France); Jalal M. Fadili, Ctr. National de la Recherche Scientifique (France); Isabelle Grenier, Jean-Marc Casandjian, Commissariat à l'Énergie Atomique (France)

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Session 10: Sparsity in Multidimensional Inverse Problems I

Date: **Tuesday 4 August**

Time: **2:30 PM - 3:10 PM**

Session Chairs: **Jalal M. Fadili**, Service d'aéronomie (France); **Jean-Luc Starck**, Commissariat à l'Énergie Atomique (France)

Poisson noise removal in multivariate count data

Paper 7446-46

Author(s): Jalal M. Fadili, Ctr. National de la Recherche Scientifique (France); Jean-Luc Starck, Commissariat à l'Énergie Atomique (France); Bo Zhang, Institut Pasteur (France); Seth Digel, Stanford Linear Accelerator Ctr. (United States)

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Three-dimensional inpainting using sparse representations

Paper 7446-47

Author(s): Arnaud Woiselle, Jean-Luc Starck, Commissariat à l'Énergie Atomique (France); Jalal M. Fadili, Ctr. National de la Recherche Scientifique (France)

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Session 11: Sparsity in Multidimensional Inverse Problems II

Date: **Tuesday 4 August**

Time: **3:40 PM - 5:00 PM**

Session Chairs: **Jalal M. Fadili**, Service d'aéronomie (France); **Jean-Luc Starck**, Commissariat à l'Énergie Atomique (France)

Sparsity and morphological diversity for multivalued data analysis

Paper 7446-48

Author(s): Jerome Bobin, California Institute of Technology (United States); Jean-Luc Starck, Yassir Moudden, Commissariat à l'Énergie Atomique (France); Jalal M. Fadili, Ctr. National de la Recherche Scientifique (France)

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An aggregator view of NL-Means

Paper 7446-49

Author(s): Erwan Le Pennec, Joseph Salmon, Univ. Paris 7-Denis Diderot (France)

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Distributed compressed sensing for sensor networks using p-thresholding

Paper 7446-50

Author(s): Mohammad Golbabaee, Pierre Vandergheynst, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

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Compressive photon-limited imaging

Paper 7446-51

Author(s): Rebecca M. Willett, Duke Univ. (United States)

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