

MGA Workshop I: Multiscale Geometry in Image Processing and Coding

Monday September 20, 2004

- 12:00 *Sparse representations/nonlinear approximation*
- 8:30–9:15 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:15–9:30 *Welcome and Opening Remarks*
- 9:30–10:30 **Emmanuel Candes** (California Institute of Technology)
Robust Uncertainty Principles: Exact Signal Reconstruction from Highly Incomplete Frequency Information
- 10:30–11:00 *Break*
- 11:00–12:00 **Justin Romberg** (California Institute of Technology)
Robust Uncertainty Principles and Optimally Sparse Decompositions
- 12:00–2:00 *Lunch (on your own)*
- 2:00–3:00 **Luminita Vese** (UCLA)
Energy minimization models for image decomposition into cartoon and texture
- 3:00–3:30 *Break*
- 3:30–4:30 **Michael Elad** (Technion, Haifa, Israel)
Sparse Representations of Signals - Theory and Applications
- 4:30–4:45 *Break*
- 4:45–5:45 **Richard Baraniuk** (Rice University)
Multiscale Geometric Frames and Tilings
- 5:45–7:30 *Wine/Cheese Reception (Hosted by IPAM)*

Tuesday September 21, 2004

- 12:00 *Vision, Sparse Coding and PDEs in imaging*
- 8:30–9:30 *Continental Breakfast*
- 9:30–10:30 **David Field** (Cornell University)
Towards a unified geometry of non-linearities in visual neurons
- 10:30–11:00 *Break*

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- 11:00–12:00 **Eero Simoncelli** (New York University/Courant Institute of Mathematical Sciences)
Joint statistics of multi-scale derivative operators
- 12:00–2:00 *Lunch (on your own)*
- 2:00–3:00 **Bruno Olshausen** (University of California at Davis)
Sparse coding of time-varying natural images
- 3:00–3:30 *Break*
- 3:30–4:30 **Guillermo Sapiro** (University of Minnesota)
Geometric (Multiscale) Representation of Elevation Maps and Point Cloud Data
- 4:30–4:45 *Break*
- 4:45–5:45 **Naoki Saito** (University of California at Davis)
Image Analysis and Approximation via Generalized Polyharmonic Local Trigonometric Transform

Wednesday September 22, 2004

- 12:00 *X-lets*
- 8:30–9:30 *Continental Breakfast*
- 9:30–10:30 **Stéphane Mallat** (Ecole Polytechnique, Palaiseau France/CMAP)
Hierarchical Geometrical Image Representation with Plain Wavelets
- 10:30–11:00 *Break*
- 11:00–12:00 **Jean-Luc Starck** (CEA Saclay, France)
The Curvelet Transform on the Sphere
- 12:00–1:00 **Paul Salamonowicz** (National Geospatial Agency)
Grant Opportunities at the National Geospatial Agency.
- 1:00–2:00 *Break*
- 2:00–3:00 **Bedros Afeyan** (Polymath Research Inc.)
Wavelets, Curvelets and Combined Transforms Applied to Z Pinch X Ray Backlighting, Astrophysical Radiation Jets and Microwave Images of Turbulent Clouds
- 3:00–3:30 *Break*
- 3:30–4:30 **Minh Do** (University of Illinois at Urbana-Champaign)
Discrete Geometrical Image Processing using the Contourlet Transform
- 4:30–4:45 *Break*
- 4:45–5:45 **Rebecca Willett** (Rice University)
Coarse-to-Fine Image Reconstruction
- 5:45–7:30 *Dinner (Hosted by IPAM)*

Thursday September 23, 2004

- 12:00 *Multiscale Methods in Imaging and Machine Vision*
- 8:30–9:30 *Continental Breakfast*
- 9:30–10:30 **Achi Brandt** (Weizmann Institute of Science)
Multiscale Segmentation of Visual Scenes
- 10:30–11:00 *Break*
- 11:00–12:00 **Xiaoming Huo** (Georgia Institute of Technology)
JBEAM: Multiscale Curve Coding via Beamlets
- 12:00–2:00 *Lunch (on your own)*
- 12:15–1:15 *(Optional) Tour of <http://www.loni.ucla.edu/>Laboratory of Neuro Imaging (LONI) - Please sign up at the registration table if interested*
- 2:00–3:00 **Song-Chun Zhu** (UCLA)
From Scaling Laws of Natural Images to Regimes of Statistical Models
- 3:00–3:30 *Break*
- 3:30–4:30 **Davi Geiger** (New York University/Courant Institute of Mathematical Sciences)
Trees and Belief Propagation Networks
- 4:30–4:45 *Break*
- 4:45–5:45 **Hamid Krim** (University of North Carolina)
Morse Theory in Object Representation and Classification

Friday September 24, 2004

- 12:00 *Application in Medical Imaging*
- 8:30–9:30 *Continental Breakfast*
- 9:30–10:30 **Amir Averbuch** (Tel-Aviv University, Israel)
- 10:30–11:00 *Break*
- 11:00–12:00 **Hemant Tagare** (Yale University)
Segmenting Cardiac Ultrasound Images with Active Contours
- 12:00–1:00 *Lunch (on your own)*
- 1:00–2:00 **Roland Wilson** (University of Warwick)
Multiresolution Image Segmentation
- 2:00–2:30 *Break*

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- 2:30–3:30 **Stanley Osher** (IPAM)
An Iterative Regularization Method and Inverse Scale Space for Image Restoration
- 3:30–3:45 *Break*
- 3:45–4:45 **Francois Meyer** (University of Colorado)
Multiscale Analysis of fMRI Data
- 4:45–12:00 *Conclusion*

