

CURRICULUM VITAE

PERSONAL INFORMATION

Name: Bin Dong **E-mail:** *b1dong@math.ucsd.edu*

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Mailing Address: Department of Mathematics, University of California San Diego, 9500 Gilman Drive, La Jolla, CA, 92093-0112.

EDUCATION

University of California, Los Angeles, USA

Ph.D candidate in Mathematics, Department of Mathematics, Sep. 2005 – June 2009.

Advisor: Stanley Osher.

National University of Singapore, Singapore

M.Sc. in Mathematics, Department of Mathematics, August, 2005.

Advisor: Zuowei Shen.

Peking University, Beijing, P. R. China

B.S. in Mathematics, School of Mathematical Sciences, July, 2003.

Advisor: Zhong Li.

PROFESSIONAL EXPERIENCE

- SEW Assistant Professor, Department of Mathematics, UCSD
July 2009 - present

RESEARCH INTERESTS

- Numerical Partial Differential Equations, Level Set Methods.
- Optimization Problems (e.g. ℓ_1 -Minimizations and Compressive Sensing).
- Wavelet Theory and Applications.
- Image Processing and Biomedical Shape Analysis.

CURRENT PROJECTS& WORKING PROBLEMS

- Fast ℓ_1 minimization and its applications in signal and image processing.
- Multiscale representation (wavelet flavored but PDE and level set based) for surfaces and its applications.
- Biological shape analysis (e.g. registration and feature extraction).
- Level set and PDE based surface reconstruction/restoration.
- Mathematical models for analyzing infrared spectroscopy.

PUBLICATIONS

Under Review:

1. Y. Mao, B. Dong and S. Osher, *A nonlinear PDE-based method for sparse deconvolution*, submitted, Aug. 2009.
2. B. Dong, A. Chien, Z. Shen and S. Osher, *A new multiscale representation for shapes and its application to blood vessel recovery*, submitted, March 2009.

In Press or accepted:

1. B. Dong, A. Chien, Y. Mao, J. Ye, S. Osher, *Level set based brain aneurysm capturing in 3D*, accepted by Inverse Problems and Imaging (special issue in medical image analysis), 2009.
2. B. Dong, E. Savitsky and S. Osher, *A Novel Method for Enhanced Needle Localization Using Ultrasound-Guidance*, accepted by International Symposium on Visual Computing (ISVC2009), Nov 30–Dec 2, 2009.

3. B. Dong, Y. Mao, I. D. Dinov, Z. Tu, Y. Shi, Y. Wang and A. W. Toga, *Wavelet-Based Representation of Biological Shapes*, accepted by International Symposium on Visual Computing (ISVC2009), Nov 30–Dec 2, 2009.
4. B. Dong, N. Dyn and K. Hormann, Properties of dual pseudo-splines, accepted by Applied and Computational Harmonic Analysis, 2009.
5. S. Osher, Y. Mao, B. Dong, W. Yin, *Fast linearized Bregman iterations for compressive sensing and sparse denoising*, accepted by Communications in Mathematical Sciences (CAM-Report 08-37), Dec 2008.
6. B. Dong, A. Chien, Y. Mao, J. Ye, S. Osher, *Level set based surface capturing in 3D medical images*, MICCAI 2008: the 11th International Conference on Medical Image Computing and Computer Assisted Intervention, New York, Sep. 6-10, 2008.
7. B. Dong, J. Ye, S. Osher and I. D. Dinov, *Level set based nonlocal surface restoration*, Multiscale Modeling and Simulation (MMS), **7(2)**, 589–598, 2008.
8. B. Dong and Z. Shen, *Pseudo-splines, wavelets and framelets*, Appl. Comput. Harmon. Anal., **22**, 78–104 (2007).
9. B. Dong and Z. Shen, *Linear independence of pseudo-splines*, Proc. Amer. Math. Soc., **134(9)**, 2685–2694 (2006).
10. B. Dong and Z. Shen, *Construction of biorthogonal wavelets from pseudo-splines*, J. Approx. Theory, Vol **138(2)**, 211–231 (2006).

Paper(s) Under Preparation:

- Bin Dong, Teng Wang, Barry Merriman and Stanley Osher. Sparse deconvolution and image processing in bead-based DNA sequencing, 2009.
- J. Ye, I. Yanovsky, B. Dong, R. Gandlin, A. Brandt, H. Zhao, S. Osher. Multigrid narrow band surface reconstruction via level set functions, 2009.

Other Publications:

- B. Dong, *The Implicit Representation of biological shapes and forms*, Biomedical Computation Review (Under The Hood), Published by Simbios, the NIH National Center for Physics-Based Simulation of Biological Structures, Spring 2009.
- **Master Thesis:** *Pseudo-splines, wavelets and framelets*, National University of Singapore, June 2005.
- **PhD Thesis:** *Applications of Variational Models and Partial Differential Equations in Medical Image and Surface Processing*, University of California, Los Angeles (UCLA), June 2009.

HONORS AND AWARDS

- University Fellowships, UCLA, 2005–2009.
- Silver Medal, New World Mathematics Award for Master Thesis, 4th International Congress of Chinese Mathematicians, Dec 17–22 2007.
- Research Scholarship from National University of Singapore, 2003–2005.

ACADEMIC EXPERIENCE

Conference/Workshop Talks:

- Invited talk. Pacific Rim Mathematics Conference, Mathematical Imaging Session, June 28-July 2, 2010, Stanford University, California, USA.
- Invited talk. Summer School and Workshop on Imaging Sciences and Medical Applications, June 14-25, 2010, Coimbra, Portugal.
- Selected presentation. *A Novel Method for Enhanced Needle Localization Using Ultrasound-Guidance*. International Symposium on Visual Computing (ISVC2009), Nov 30-Dec 2, 2009, Las Vegas, Nevada, USA.
- Selected presentation. *Wavelet-Based Representation of Biological Shapes*. International Symposium on Visual Computing (ISVC2009), Nov 30-Dec 2, 2009, Las Vegas, Nevada, USA.

- Invited talk. *A nonlinear PDE-based method for sparse deconvolution*. The 20th International Symposium of Mathematical Programming, August 23-28, 2009, Chicago, Illinois, USA.
- Invited talk. *Level set based surface capturing in 3D medical images*. Midwest Conference on Mathematical Methods for Images and Surfaces, April 18-19, 2009, Michigan State University, Michigan, USA.
- Invited talk. *Level set based surface capturing in 3D medical images*. Workshop on Mathematical Imaging and Digital Media, Institute for Mathematical Sciences, June 16-20, 2008, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Invited talk. *Fast linearized Bregman iteration for compressive sensing and sparse denoising*. Chinese-French-Singaporean Joint Workshop on Wavelet Theory and Applications, Institute for Mathematical Sciences, June 9-13, 2008, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- *Pseudo-splines, wavelets and framelets*. International Conference on Wavelet Theory and Applications: New Directions and Challenges, August 10-13, 2004, Institute for Mathematical Sciences, National University of Singapore, Singapore.

Conference/Workshop Posters:

- *A Novel Method for Enhanced Needle Localization Using Ultrasound-Guidance*, Compressive-Sensing Workshop, Feb. 25-27, 2009, Duke University, North Carolina, USA.
- *Level set based surface capturing in 3D medical images*, 11th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI2008), Sep. 6-10, 2008, New York, USA.

Journal Review:

- Elsevier: Applied and Computational Harmonic Analysis; Journal of Computational Physics; Journal of Approximation Theory;
- Springer: Journal of Fourier Analysis and Applications;
- Global Science Press: Journal of Computational Mathematics;

Membership:

- SIAM student member
- AMS student member

TEACHING

Lecturing (Department of Mathematics, UCSD):

- MATH 20D, Introduction to Differential Equations, Fall 2009.
- MATH 10B, Calculus, Winter 2009.
- MATH 170A, Introduction to Numerical Analysis: Linear Algebra, Winter 2009.
- MATH 170B, Introduction to Numerical Analysis: Approximation and Nonlinear Equations, Spring 2010.

Teaching Assistant (Department of Mathematics, UCLA):

- MATH 3B, Calculus for Life Science Students, Winter 2007/Fall 2007/Winter 2008.
- MATH 3A, Calculus for Life Science Students, Fall 2006.
- MATH 33B, Differential Equations, Fall 2006.

Lab Assistant (Department of Mathematics, National University of Singapore):

- MA1104, Multivariable Calculus, Semester II 2004/2005.
- MA1505, Mathematics I, Semester I 2004/2005.
- MA2213, Numerical Analysis I, Semester I 2004/2005.

REFERENCES
(RESEARCH)

Professor Stanley Osher

Professor, Department of Mathematics, University of California, Los Angeles.

Mailing Address: UCLA Mathematics Department, Box 951555, Los Angeles, CA, 90095-1555, USA.

Email: sjo@math.ucla.edu; *Tel(O):*1-310-825-1758; *Fax:*1-310-206-6673.

Professor Zuowei Shen

Professor, Department of Mathematics, National University of Singapore.

Mailing Address: Department of Mathematics, National University of Singapore, Singapore, 119260.

Email: matzuows@nus.edu.sg; *Tel(O):*(65)6516-6913; *Fax:*(65)6779-5452.

Professor Luminita Vese

Professor, Department of Mathematics, University of California, Los Angeles.

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Professor Eric Savitsky

Clinical Professor of Medicine/Emergency Medicine, UCLA School of Medicine.

Director, UCLA International Emergency Medicine Center.

Mailing Address: University of California, Los Angeles, BOX 951777, Suite 300, 924 Westwood Blvd, Los Angeles, CA 90095-1777.

Email: esavitsk@ucla.edu; *Tel(O):*1-310-794-3086; *Fax:*1-310-794-0599.

REFERENCES
(TEACHING)

Professor Sorin Popa

Professor, Department of Mathematics, University of California, Los Angeles.

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Email: popa@math.ucla.edu; *Tel(O):*1-310-825-1378; *Fax:*1-310-206-6673.