

CURRICULUM VITAE

PERSONAL INFORMATION

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

EDUCATION

University of California, Los Angeles, USA

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

Advisor: Stanley Osher.

National University of Singapore, Singapore

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

Advisor: Zuowei Shen.

Thesis Title: *Pseudo-splines, wavelets and framelets.*

Peking University, Beijing, P. R. China

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

Advisor: Zhong Li.

Thesis Title: *Complex Dynamics.*

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.
- Design fast solvers for nonlinear PDEs via wavelets/framelets transforms.
- Region segmentation in 3D biological surfaces (e.g. cerebral aneurysm) via level set based PDE models.
- Ultrasound image analysis (denoising, segmentation and needle tracking).
- Level set and PDE based surface reconstruction/restoration.
- Dual pseudo-splines.

PUBLICATIONS

- B. Dong, E. Savitsky and S. Osher, *A Novel Method for Enhanced Needle Localization Using Ultrasound-Guidance*, UCLA CAM-Report 08-65, Sep. 2008.
- B. Dong, A. Chien, Y. Mao, J. Ye, S. Osher, *Level set based brain aneurysm capturing in 3D*, submitted to IEEE Trans. Medical. Imaging, July 2008.
- S. Osher, Y. Mao, B. Dong, W. Yin, *Fast linearized Bregman iterations for compressive sensing and sparse denoising*, submitted(CAM-Report 08-37), June 2008.
- 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.
- 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 (CAM-Report **07-44**), 2008
- B. Dong, Y. Mao, I. D. Dinov, Z. Tu, Y. Shi, Y. Wang and A. W. Toga, *Wavelet-Based Representation of Biological Shapes*, CAM-Report **07-36** (manuscript), Sep. 2007.
- B. Dong and Z. Shen, *Pseudo-splines, wavelets and framelets*, Appl. Comput. Harmon. Anal., **22**, 78–104 (2007).

- B. Dong and Z. Shen, *Linear independence of pseudo-splines*, Proc. Amer. Math. Soc., **134 (9)**, 2685–2694 (2006).
- B. Dong and Z. Shen, *Construction of biorthogonal wavelets from pseudo-splines*, J. Approx. Theory, Vol **138 (2)**, 211–231 (2006).

Papers Under Preparation:

- Bin Dong, Nira Dyn, Kai Hormann and Zuowei Shen, *Regularity of dual pseudo-splines and the construction of symmetric tight framelets*.
- Bin Dong, Aichi Chien, Rongjie Lai, Zuowei Shen, and Stanley Osher, *Level set based multiscale surface representation and its applications in surface inpainting*.

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

Conference/Workshop Posters:

- *Level set based surface capturing in 3D medical images*, 11th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI2008), New York, Sep. 6-10, 2008.

Journal Review:

- Applied and Computational Harmonic Analysis, Elsevier.

Membership:

- SIAM student member
- AMS student member

PROFESSIONAL EXPERIENCE

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.

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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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