

CURRICULUM VITAE OF BIN DONG

EDUCATION

- Ph.D in Mathematics
University of California, Los Angeles, 2005–2009.
- M.Sc. in Mathematics
National University of Singapore, 2003–2005.
- B.S. in Mathematics
Peking University, 1999–2003.

POSITIONS

- Director, Center for Theory of Artificial Intelligence, Institute for Artificial Intelligence, Peking University, October 2019 - present
- Associate Professor, Beijing International Center for Mathematical Research, Peking University, December 2014 - present
- Assistant Professor, Department of Mathematics, The University of Arizona
July 2011 - December 2014
- Member, Program in Applied Mathematics, The University of Arizona
July 2011 - December 2014
- SEW Assistant Professor, Department of Mathematics, UCSD
July 2009 - June 2011

RESEARCH INTERESTS

- Inverse problems and imaging
- Image processing and analysis
- Scientific machine learning

GRANTS

- PI, *Functional minimization for precise medical image analysis*, NSFC 12090022, 2021/01–2025/12, RMB 3,250,000.
- PI, *Data-driven modeling in image processing and analysis, and its application in prediction of curative effect of neoadjuvant chemotherapy for gastric cancer*, Beijing Natural Science Foundation (BNSF) Z180001, 2018/12–2022/12, RMB 2,000,000.
- Co-I, *Big data driven optimization modeling and algorithmic design*, NSFC 11831002, 2019/01–2023/12, RMB 2,500,000. (PI: Zaiwen Wen, Peking University)
- PI, *Wavelet Frames on Generic Domains and Applications*, NSFC 11671022, 2017/01–2020/12, RMB 480,000.
- Co-I, *Merging Algorithms in Data Analysis: Research and Education*, Tianyuan Fund for Mathematics of the National Natural Science Foundation of China Grant, NSFC 11626244, 2017/01C2017/12, RMB 1,000,000. (PI: Pingwen Zhang, Peking University)
- Co-I, *Air Quality Statistics Diagnostic Model*, National Key Research and Development Plan Grant 2016YFC0207703, 2016/07–2020/06, RMB 16,030,000. (PI: Song-Xi Chen, Peking University)
- Co-I, *Study of the key algorithms for the 3D reconstruction of cryo-electron microscopy and its applications*, NSFC 91530321, 2016/01–2018/12, RMB 2,320,000. (PI: Hongrong Liu, Hunan Normal University)
- PI, *Collaborative Research: Wavelet Frames for Variational Models in Imaging: Bridging Discrete and Continuum*, NSF DMS-1418772, 2014/08–2017/07, \$170,000.

HONORS AND AWARDS

- Qiu Shi Outstanding Young Scholar Award, Qiu Shi Foundation, Hong Kong, China, 2014.
- Silver Medal, New World Mathematics Award for Master Thesis, 4th International Congress of Chinese Mathematicians, Dec. 2007.

Preprint

1. Qi Sun, Hexin Dong, Zewei Chen, Weizhen Dian, Jiacheng Sun, Yitong Sun, Zhenguo Li, Bin Dong, *A Practical Layer-Parallel Training Algorithm for Residual Networks*, arXiv:2009.01462, 2020.
2. Ti Bai, Biling Wang, Dan Nguyen, Bao Wang, Bin Dong, Wenxiang Cong, Mannudeep K. Kalra and Steve Jiang, *Deep Interactive Denoiser (DID) for X-Ray Computed Tomography*, arXiv:2011.14873, 2020.
3. Yuyan Chen, Bin Dong, Jinchao Xu, *Meta-MgNet: Meta Multigrid Networks for Solving Parameterized Partial Differential Equations*, arXiv:2010.14088, 2020.
4. Yunzhen Feng, Runtian Zhai, Di He, Liwei Wang and Bin Dong, *Transferred Discrepancy: Quantifying the Difference Between Representations*, arXiv:2007.12446, 2020.
5. Junyu Liu, Zichao Long, Ranran Wang, Jie Sun and Bin Dong, *RODE-Net: Learning Ordinary Differential Equations with Randomness from Data*, arXiv:2006.02377, 2020.
6. Pengfei Jin, Tianhao Lai, Rongjie Lai and Bin Dong, *NPTC-net: Narrow-Band Parallel Transport Convolutional Neural Network on Point Clouds*, arXiv: 1905.12218, 2019.
7. Stefan C. Schonsheck, Bin Dong and Rongjie Lai, *Parallel Transport Convolution: A New Tool for Convolutional Neural Networks on Manifolds*, arXiv:1805.07857, 2018.

Journal Articles

1. Bin Dong, Zuowei Shen and Jianbin Yang, *Approximation from Noisy Data*, accepted by SIAM Journal on Numerical Analysis, 2021.
2. Peiting You, Xiang Li, Zhijiang Wang, Huali Wang, Bin Dong and Quanzheng Li, *Characterization of Brain Iron Deposition Pattern and Its Association With Genetic Risk Factor in Alzheimers Disease Using Susceptibility-Weighted Imaging*, Front. Hum. Neurosci., <https://doi.org/10.3389/fnhum.2021.654381>
3. Ziju Shen, Yufei Wang, Dufan Wu, Xu Yang and Bin Dong, *Learning to Scan: A Deep Reinforcement Learning Approach for Personalized Scanning in CT Imaging*, Inverse Problems and Imaging, doi:10.3934/ipi.2021045, 2021 (arXiv:2006.02420).
4. Haimiao Zhang, Baodong Liu, Hengyong Yu and Bin Dong, *MetaInv-Net: Meta Inversion Network for Sparse View CT Image Reconstruction*, IEEE Transactions on Medical Imaging, **40 (2)**, 621–634, 2021 (arXiv:2006.00171).
5. Bin Dong, Haochen Ju, Yiping Lu and Zuoqiang Shi, *CURE: Curvature Regularization For Missing Data Recovery*, SIAM Journal on Imaging Science, **13(4)**, 2169–2188, 2020 (arXiv:1901.09548).
6. Yufei Wang, Ziju Shen, Zichao Long and Bin Dong, *Learning to Discretize: Solving 1D Scalar Conservation Laws via Deep Reinforcement Learning*, Communications in Computational Physics, **28**, 2158–2179, 2020 (arXiv: 1905.11079).
7. Junyu Liu, Xiao Wang, Yan Zhao, Bin Dong, Kuan Lu and Ranran Wang, *Heating load forecasting for combined heat and power plants via strand-based LSTM*, IEEE Access, **8**, 33360–33369, 2020.
8. Jae Kyu Choi, Bin Dong and Xiaoqun Zhang, *An edge driven wavelet frame model for image restoration*, Applied and Computational Harmonic Analysis, **48(3)**:993-1029, 2020.
9. Zichao Long, Yiping Lu and Bin Dong, *PDE-Net 2.0: Learning PDEs from Data with A Numeric-Symbolic Hybrid Deep Network*, Journal of Computational Physics, **399**, 108925, 2019. (arXiv:1812.04426)
10. Geng Chen, Bin Dong, Yong Zhang, Weili Lin, Dinggang Shen and Pew-Thian Yap, *XQ-SR: Joint x - q Space Super-Resolution with Application to Infant Diffusion MRI*, Medical Image Analysis, doi: <https://doi.org/10.1016/j.media.2019.06.010>, 2019.

11. Geng Chen, Bin Dong, Yong Zhang, Weili Lin, Dinggang Shen and Pew-Thian Yap, *Denoising of Diffusion MRI Data via Graph Framelet Matching in x - q Space*, IEEE Transactions on Medical Imaging, DOI: 10.1109/TMI.2019.2915629, 2019.
12. Chenglong Bao, Jae Kyu Choi and Bin Dong, *Whole Brain Susceptibility Mapping Using Harmonic Incompatibility Removal*, SIAM Journal on Imaging Science, 12(1), 492-520, 2019 (arXiv1805.12521).
13. Geng Chen, Jian Zhang, Yong Zhang, Bin Dong, Dinggang Shen and Pew-Thian Yap, *Multi-channel framelet denoising of diffusion weighted images*, PLoS ONE, 14(2): e0211621, 2019.
14. Geng Chen, Bin Dong, Yong Zhang, Weili Lin, Dinggang Shen and Pew-Thian Yap, *Angular upsampling in infant diffusion MRI using neighborhood matching in x - q space*, Front. Neuroinform. 12:57. doi: 10.3389/fninf.2018.00057.
15. Zenghui Wei, Baodong Liu, Bin Dong and Long Wei, *A joint reconstruction and segmentation method for limited-angle X-ray tomography*, IEEE Access, 6(1), 7780–7791, 2018.
16. Haimiao Zhang, Bin Dong and Baodong Liu, *A re-weighted joint spatial-Radon domain CT image reconstruction model for metal artifact reduction*, SIAM Journal on Imaging Science, 11(1), 707–733 2018.
17. Yue Selena Niu, Ning Hao and Bin Dong, *A new reduced-rank linear discriminant analysis method and its applications*, Statistica Sinica, 28, 189–202, 2018.
18. Bin Dong, Qingtang Jiang and Zuowei Shen, *Image restoration: wavelet frame shrinkage, nonlinear evolution PDEs, and beyond*, Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal, 15(1), 606–660, 2017.
19. Yu Yang, Bin Dong and Zaiwen Wen, *Randomized Algorithms For High Quality Treatment Planning in Volumetric Modulated Arc Therapy*, Inverse Problems, 33(2), 025007, 2017.
20. Bin Dong, Zuowei Shen and Peichu Xie, *Image restoration: a general wavelet frame based model and its asymptotic analysis*, SIAM Journal on Mathematical Analysis, 49(1), 421C-445, 2017.
21. Bin Dong, *Sparse Representation on Graphs by Tight Wavelet Frames and Applications*, Applied and Computational Harmonic Analysis, 42(3), 452C-479, 2017.
22. Jae Kyu Choi, Bin Dong and Xiaoqun Zhang, *Limited Tomography Reconstruction via Tight Frame and Simultaneous Sinogram Extrapolation*, Journal of Computational Mathematics, 34(6), 575C-589, 2016.
23. Chenglong Bao, Bin Dong, Likun Hou, Zuowei Shen and Xiaoqun Zhang, Xue Zhang, *Image restoration by minimizing zero norm of wavelet frame coefficients*, Inverse Problems, 32(11), 2016.
24. Ruohan Zhan and Bin Dong, *CT Image Reconstruction by Spatial-Radon Domain Data-Driven Tight Frame Regularization*, SIAM Journal on Imaging Sciences, 9(3), 1063–1083, 2016.
25. Bin Dong, Qingtang Jiang, Chaoqiang Liu and Zuowei Shen, *Multiscale Representation of Surfaces by Tight Wavelet Frames with Applications to Denoising*, Applied and Computational Harmonic Analysis, 41(2), 561–589, 2016.
26. Jian-Feng Cai, Bin Dong and Zuowei Shen, *Image restoration: A wavelet frame based model for piecewise smooth functions and beyond*, Applied and Computational Harmonic Analysis, 41(1), 94–138, 2016.
27. Jiulong Liu, Xiaoqun Zhang, Bin Dong, Zuowei Shen and Lixu Gu, *A wavelet frame method with shape prior for ultrasound video segmentation*, SIAM Journal on Imaging Sciences, 9(2), 495–536, 2016.
28. Ning Hao, Bin Dong and Jianqing Fan, *Sparsifying the Fisher Linear Discriminant by Rotation*, Journal of the Royal Statistical Society Series B, 77(4), 827-851, 2015.

29. Li-Tien Cheng, Bin Dong, Chunhua Men, Xun Jia and Steve B. Jiang, *Binary Level-Set Shape Optimization Model and Algorithm for Volumetric Modulated Arc Therapy in Cancer Radiotherapy*, SIAM Journal on Scientific Computing, **35(6)**, 1321–1340, 2013.
30. Xuejun Gu, Bin Dong, Jing Wang, John Yordy, Loren Mell, Xun Jia, and Steve B. Jiang, *A Contour-Guided Deformable Image Registration Algorithm for Adaptive Radiotherapy*, Physics in Medicine and Biology, **58(6)**, 1889, 2013.
31. Bin Dong and Yong Zhang, *An efficient algorithm for ℓ_0 minimization in wavelet frame based image restoration*, Journal of Scientific Computing, **54(2-3)**, 350–368, 2013.
32. Bin Dong, Jia Li and Zuowei Shen, *X-ray CT image reconstruction via wavelet frame based regularization and Radon domain inpainting*, Journal of Scientific Computing, **54(2-3)**, 333–349, 2013.
33. Yong Zhang, Bin Dong and Zhaosong Lu, *ℓ_0 minimization for wavelet frame based image restoration*, Mathematics of Computation, **82**, 995–1015, 2013.
34. Bin Dong, Yan Jiang Graves, Xun Jia and Steve B. Jiang, *Optimal Surface Marker Locations for Tumor Motion Estimation in Lung Cancer Radiotherapy*, Physics in Medicine and Biology, **57(24)**, 8201, 2012.
35. Jian-Feng Cai, Bin Dong, Stanley Osher and Zuowei Shen, *Image restoration: total variation; wavelet frames; and beyond*, Journal of the American Mathematical Society, **25(4)**, 1033–1089, 2012.
36. Bin Dong, Hui Ji, Jia Li, Zuowei Shen and Yuhong Xu, *Wavelet frame based blind image inpainting*, Applied and Computational Harmonic Analysis, **32(2)**, 268–279, 2012.
37. Bin Dong and Zuowei Shen, *Wavelet frame based surface reconstruction from unorganized points*, Journal of Computational Physics, **230(22)**, 8247–8255, 2011.
38. Xun Jia, Bin Dong, Yifei Lou and Steve B. Jiang, *GPU-based iterative cone beam CT reconstruction using tight frame regularization*, Physics in Medicine and Biology, **56**, 3787–3807, 2011.
39. A. Chien, J. Sayre, B. Dong, J. Ye and F. Vinuela, *3D Quantitative Evaluation of Atherosclerotic Plaque based on Rotational Angiography*, American Journal of Neuroradiology, **32**, 1249–1254, 2011
40. Zhen Tian, Xun Jia, Bin Dong, Yifei Lou and Steve B. Jiang, *Low-dose 4DCT reconstruction via temporal nonlocal means*, Medical Physics, **38 (3)**, March 2011.
41. B. Dong, A. Chien and Z. Shen, *Frame based segmentation for medical images*, Communications in Mathematical Sciences, **9(2)**, 551–559, 2011.
42. Daren Lee, Ivo Dinov, Bin Dong, Boris Gutman, Igor Yanovsky and Arthur W. Toga, *CUDA optimization strategies for compute- and memory-bound neuroimaging algorithms*, Computer Methods and Programs in Biomedicine, Elsevier, 2010.
43. Y. Mao, B. Dong and S. Osher, *A nonlinear PDE-based method for sparse deconvolution*, Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal, **8(3)**, 965–976, 2010.
44. B. Dong, A. Chien, Z. Shen and S. Osher, *A new multiscale representation for shapes and its application to blood vessel recovery*, SIAM Journal on Scientific Computing, **32(4)**, 1724–1739, 2010.
45. B. Dong, A. Chien, Y. Mao, J. Ye and S. Osher, *Level set based brain aneurysm capturing in 3D*, Inverse Problems and Imaging (special issue in medical image analysis), **4(2)**, 241–255, 2010.
46. B. Dong, N. Dyn and K. Hormann, *Properties of dual pseudo-splines*, Applied and Computational Harmonic Analysis, **29(1)**, 104–110, 2010.

47. S. Osher, Y. Mao, B. Dong and W. Yin, *Fast linearized Bregman iterations for compressive sensing and sparse denoising*, Communications in Mathematical Sciences, Vol. **8(1)**, 93–111, 2010.
48. B. Dong, J. Ye, S. Osher and I. D. Dinov, *Level set based nonlocal surface restoration*, Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal, **7(2)**, 589–598, 2008.
49. B. Dong and Z. Shen, *Pseudo-splines, wavelets and framelets*, Appl. Comput. Harmon. Anal., **22**, 78–104, 2007.
50. B. Dong and Z. Shen, *Linear independence of pseudo-splines*, Proc. Amer. Math. Soc., **134(9)**, 2685–2694, 2006.
51. B. Dong and Z. Shen, *Construction of biorthogonal wavelets from pseudo-splines*, J. Approx. Theory, Vol **138(2)**, 211–231, 2006.

Conference Proceedings

1. Ce Wang, Haimiao Zhang, Qian Li, Kun Shang, Yuanyuan Lyu, Bin Dong, S. Kevin. Zhou, *Generalizable Limited-Angle CT Reconstruction via Sinogram Extrapolation*, MICCAI 2021 (arXiv:2103.05255).
2. Chizhou Liu, Yunzhen Feng, Ranran Wang and Bin Dong, *Enhancing Certified Robustness of Smoothed Classifiers via Weighted Model Ensembling*, ICML 2021 Workshop on Adversarial Machine Learning (arXiv:2005.09363).
3. Haiwen Huang, Zhihan Li, Lulu Wang, Sishuo Chen, Bin Dong, Xinyu Zhou, *Feature Space Singularity for Out-of-Distribution Detection*, AAAI Workshop on SafeAI, 2021 (arXiv:2011.14654).
4. Fei Yu, Mo Zhang, Hexin Dong, Sheng Hu, Bin Dong, Li Zhang, *DAST: Unsupervised Domain Adaptation in Semantic Segmentation Based on Discriminator Attention and Self-Training*, AAAI 2021.
5. Mo Zhang, Bin Dong and Quanzheng Li, *Deep Active Contour Network for Medical Image Segmentation*, MICCAI 2020.
6. Fei Yu, Hexin Dong, Mo Zhang, Jie Zhao, Bin Dong, Quanzheng Li, Li Zhang, *AF-SEG: an Annotation-Free Approach for Image Segmentation by Self-Supervision and Generative Adversarial Network*, IEEE International Symposium on Biomedical Imaging (ISBI20), 2020.
7. Hexin Dong, Fei Yu, Jiang Han, Zhang Hua, Bin Dong, Quanzheng Li, Li Zhang, *Annotation-Free Gliomas Segmentation Based on a Few Labeled General Brain Tumor Images*, IEEE International Symposium on Biomedical Imaging (ISBI20), 2020.
8. Bin Dong, Jikai Hou, Yiping Lu and Zhihua Zhang, *Distillation \approx Early Stopping? Harvesting Dark Knowledge Utilizing Anisotropic Information Retrieval for Overparameterized Neural Network*, NeurIPS 2019 Workshop on Machine Learning with Guarantees, (arXiv:1910.01255).
9. Yiping Lu, Zhuohan Li, Di He, Zhiqing Sun, Bin Dong, Tao Qin, Liwei wang, Tie-Yan Liu, *Understanding and Improving Transformer from a Multi-Particle Dynamic System Point of View*, NeurIPS 2019, Workshop on Machine Learning and the Physical Sciences (arXiv:1906.02762).
10. Dinghuai Zhang, Tianyuan Zhang, Yiping Lu, Zhanxing Zhu, Bin Dong, *You Only Propagate Once: Accelerating Adversarial Training Using Maximal Principle*, NeurIPS 2019 (arXiv:1905.00877).
11. Yini Pan, Hongfeng Li, Lili Liu, Quanzheng Li, Xinlin Hou and Bin Dong, *aEEG Signal Analysis with Ensemble Learning for Newborn Seizure Detection*, MICCAI Workshop on MMMI, 2019
12. Fei Yu, Jie Zhao, Yanjun Gong, Zhi Wang, Yuxi Li, Fan Yang, Bin Dong, Quanzheng Li and Li Zhang, *Annotation-Free Cardiac Vessel Segmentation via Knowledge Transfer from Retinal Images*, MICCAI 2019.

13. Haiwen Huang, Chang Wang and Bin Dong, *Nostalgic Adam: Weighing more of the past gradients when designing the adaptive learning rate*, IJCAI 2019 (arXiv:1805.07557).
14. Haimiao Zhang, Bin Dong and Baodong Liu, JSR-Net: A Deep Network for Joint Spatial-Radon Domain CT Reconstruction from incomplete data, accepted by the International Conference on Acoustics, Speech, and Signal Processing (IEEE-ICASSP 2019), 2019 (arXiv:1812.00510).
15. Xiaoshuai Zhang, Yiping Lu, Jiaying Liu and Bin Dong, Dynamically Unfolding Recurrent Restorer: A Moving Endpoint Control Method for Image Restoration, ICLR 2019 (arXiv:1805.07709).
16. Dufan Wu, Kyungsang Kim, Bin Dong, Georges El Fakhri and Quanzheng Li, *End-to-End Lung Nodule Detection in Computed Tomography*, MICCAI MLMI Workshop, 2018 (arXiv:1711.02074).
17. Yiping Lu, Aoxiao Zhong, Quanzheng Li and Bin Dong, *Beyond Finite Layer Neural Networks: Bridging Deep Architectures and Numerical Differential Equations*, Thirty-fifth International Conference on Machine Learning (ICML), 2018 (arXiv:1710.10121).
18. Zichao Long, Yiping Lu, Xianzhong Ma and Bin Dong, *PDE-Net: Learning PDEs from Data*, Thirty-fifth International Conference on Machine Learning (ICML), 2018 (arXiv:1710.09668).
19. Geng Chen, Bin Dong, Yong Zhang, Dinggang Shen, Pew-Thian Yap, *q-Space Upsampling Using x - q Space Regularization*, MICCAI 2017, 620–628.
20. Geng Chen, Bin Dong, Yong Zhang, Dinggang Shen, Pew-Thian Yap, *Neighborhood Matching for Curved Domains with Application to Denoising in Diffusion MRI*, MICCAI 2017, 629–637.
21. Pew-Thian Yap, Bin Dong, Yong Zhang and Dinggang Shen, *Tight Graph Framelets for Sparse Diffusion MRI q -Space Representation*, MICCAI 2016, the 19th International Conference on Medical Image Computing and Computer Assisted Intervention, October 17-21, 2016, Athens, Greece.
22. Bin Dong and Ning Hao, *Semi-supervised high dimensional clustering by tight wavelet frames*, Proceedings of SPIE 2015, Wavelets & Sparsity XVI, Aug. 2015.
23. Bin Dong and Zuowei Shen, *Image restoration: a data-driven perspective*, Proceedings of the International Congress of Industrial and Applied Mathematics (ICIAM), Beijing, China, Aug. 10–14, 2015.
24. J. Ye, I. Yanovsky, B. Dong, R. Gandlin, A. Brandt and S. Osher, *Multigrid narrow band surface reconstruction via level set functions*, 8th International Symposium on Visual Computing (ISVC), July 16-18, 2012, Greece.
25. Bin Dong and Zuowei Shen, *MRA-based wavelet frames and applications: image segmentation and surface reconstruction*, Proceedings of SPIE, Defense, Security and Sensing, Vol 8401, 2012.
26. Xun Jia, Yifei Lou, Bin Dong, Zhen Tian and Steve Jiang, *4D computed tomography reconstruction from few-projection data via temporal non-local regularization*, MICCAI 2010: the 13th International Conference on Medical Image Computing and Computer Assisted Intervention, Beijing, China, Sep 20-24, 2010.
27. B. Dong, E. Savitsky and S. Osher, *A novel method for enhanced needle localization using ultrasound-guidance*, Advances in Visual Computing: Part I, 914-923, 2009 (5th International Symposium on Visual Computing, ISVC 2009, Las Vegas, Nevada, USA).
28. B. Dong, Y. Mao, I. D. Dinov, Z. Tu, Y. Shi, Y. Wang and A. W. Toga, *Wavelet-based representation of biological shapes*, Advances in Visual Computing: Part I, 914-923, 2009 (5th International Symposium on Visual Computing, ISVC 2009, Las Vegas, Nevada, USA).
29. B. Dong, A. Chien, Y. Mao, J. Ye and 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.

Books & Book Chapters

1. Chenyang Shen, Dan Nguyen, Zhiguo Zhou, Steve B. Jiang, Bin Dong, and Xun Jia, *An introduction to deep learning in medical physics: advantages, potential, and challenges*, Physics in Medicine and Biology, 65(5): 05TR01-, 2020.
2. Bin Dong, Mathematical and Deep Learning Methods in Image Inverse Problems, *Mathematica Numerica Sinica*, **41(4)**, 2019 (in Chinese).
3. Haimiao Zhang and Bin Dong, A Review on Deep Learning in Medical Image Reconstruction, *Journal of the Operations Research Society of China*, 8(2):311-340, 2020 (arXiv: 1906.10643).
4. Gaoyan Ou, Zhanxing Zhu, Bin Dong and Weinan E, *Introduction to Data Science*, High Education Press, 2017 (in Chinese).
5. Bin Dong and Zuowei Shen, *MRA-Based Wavelet Frames and Applications*, IAS Lecture Notes Series, in Zhao, Hong-Kai, ed. "Mathematics in Image Processing". Vol. 19. American Mathematical Society, 2013.

Other Publications:

- Bin Dong, Zuowei Shen and Xiaoqun Zhang, *Mathematical Methods in Image Restoration*, The Institute Lecture, Chinese Academy of Science, China Science Publishing & Media Ltd (Nanhua Xi eds), 2017 (in Chinese).
- Robert Crandall, Bin Dong and Ali Bilgin, *Randomized Iterative Hard Thresholding: A Fast Approximate MMSE Estimator for Sparse Approximations*, Technical Report, June 2013.
- 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.

JOURNAL EDITORIAL SERVICE

- Associate editor, *Journal of Computational Mathematics*, 2021–2023
- Associate editor, *SIAM Transactions on Applied Mathematics*, 2019–2021
- Editorial board, *Inverse Problems and Imaging*, AIMS, 2018–2020.
- Guest editor, *Applied and Computational Harmonic Analysis*, Elsevier, 2015–2016.

ACADEMIC EXPERIENCE (SELECTED)

Conference/Workshop Organization:

- Program Committee, *Mathematical and Scientific Machine Learning (MSML 2021)*, EPFL Campus, Lausanne, Switzerland, August 16-19, 2021.
- Program Committee, *Mathematical and Scientific Machine Learning (MSML 2020)*, Princeton, USA, July 15-17, 2020.
- Organizing Committee, *1st International Workshop on Multiscale Multimodal Medical Imaging (MMMI2019)*, In conjunction with *MICCAI 2019*, October 13, 2019, Shenzhen, China.
- Organizing Committee, *The Second National Conference on Big Data and Artificial Intelligence*, CSIAM; minisymposium on "Deep Learning and PDEs", Kunming, Yunnan, July 5-7, 2019.
- Organizing Committee, *International Workshop on "Recent Advances on Mathematical Imaging and Data Science"*, Shanghai Jiaotong University, July 3-5, 2019.
- Organizing Committee, *CSIAM Annual Meeting*, minisymposium on "Mathematical Theory, Models and Algorithms in Imaging Science: Medical Imaging and Image Analysis", Chengdu, Sichuan, China, September 13–16, 2018.
- Organizing Committee, *The 10th Annual Meeting on Inverse Problems*, minisymposium on "Inverse Problems in Imaging Science", Tianyuan Mathematical Center in Northeast China, Jilin University, Changchun, China, May 28–31, 2018.
- Organizing Committee, *CSIAM Annual Meeting*, minisymposium on "Mathematical Theory, Models and Algorithms in Imaging Science", Qingdao, Shandong, China, October 12–15, 2017.

- Organizing Committee, PKU-NUS Joint Workshop on Deep Learning: Theory and Applications, Peking University, Beijing, China, August 27–28, 2017.
- Organizing Committee, PKU Summer School on Data Science, Peking University, Beijing, China, July 10-23, 2017.
- Organizing Committee, PKU Workshop on Computation and Big Data Analysis, Peking University, Beijing, China, June 20-21, 2017.
- Organizing Committee, 2016 International Workshop on Signal Processing, Optimization, and Compressed sensing, Nankai University, Tianjin, China, December 17-21, 2016.
- Organizing Committee, CSIAM Annual Meeting, minisymposium on "Mathematics in Image Processing and Analysis", Xiang Tan, Hunan, China, August 12–14, 2016.
- Organizing Committee, Mathematics in Imaging Science and Data Analysis (MISDA), Peking University, Beijing, China, August 4-5, 2016.
- Organizing Committee, Computational Biomedical Imaging Workshop, Shanghai Jiaotong University, October 17-18, 2015.
- Programm Committee, Wavelets and Sparsity XVI, SPIE Optics & Photonics 2015, August 9-13, 2015, San Diego, CA, USA.
- SIAM Conference on Imaging Science, minisymposium on "Mathematics of Medical Imaging and Shape Analysis, Part I, II, III" (MS28), May 20-22, 2012, Philadelphia, Pennsylvania, USA.

Conference/Workshop/Summer School Talks:

- 45-minutes invited talk, International Congress of Mathematicians (ICM), St. Petersburg, Russia, July 6–14, 2022.
- Invited talk. "New trends in numerical multiscale methods and beyond", Institut Mittag-Leffler, Djursholm, Sweden, July 12-July 16, 2021.
- Invited talk. "Workshop on Mathematical Machine Learning and Applications", Penn State University, December 14-16, 2020 (<http://sites.psu.edu/ccma/2020workshop/>).
- "Workshop on AI & Mathematics", Institute of Natural Sciences, SJTU, Dec 5-6, 2020.
- Invited talk, Webinar series on "Mathematics, Physics and Machine Learning", November 11, 2020. (<https://mpml.tecnico.ulisboa.pt/seminars>)
- Invited talk, One World Seminar Series in Imaging and Inverse Problem, July 1, 2020. (<https://sites.google.com/view/oneworldimagine>)
- Invited talk, SIAM Conference on Mathematics and Data Science, mini-symposium on Advances in Optimal Control and Machine Learning, June 23, 2020.
- Invited participation. Deep learning and partial differential equations, American Institute for Mathematics, San Jose, CA, October 14-18, 2019.
- Invited talk. The Third Conference on Scientific and Engineering Computing for Young Chinese Scientists, Beijing, China, August 17-21, 2019.
- Plenary talk. The Second National Conference on Big Data and Artificial Intelligence, CSIAM, Kunming, Yunnan, July 5-7, 2019.
- Plenary talk. The 11th National Conference on Inverse Problems, Imaging and Applications, Lanzhou, Gansu, June 22-24, 2019.
- Invited talk. The Third International Conference on Mathematics of Data Science (MathoDS 3), City University of Hong Kong (CityU), Hong Kong, China, June 19-23, 2019.
- Invited talk. Workshop on Machine Learning Techniques in Scientific Computing, Wuhan University, Hubei, June 17-19, 2019.
- Invited talk. Recent Development on Mathematical/statistical Approaches in Data Science, Dallas, TX, USA, June 1-2, 2019.
- Invited talk. Inverse Problems, Imaging and PDE's, Institute for Advanced Studies, Hong Kong University of Science and Technology, Hong Kong, China May 20-24, 2019.
- Invited talk. "Deep Learning for Medical Imaging" in International Conference on Acoustics, Speech, and Signal Processing, Brighton, UK, May 12-17, 2019.
- Invited talk. Workshop on Geometry of Big Data, IPAM, UCLA, USA, April 29-May 3, 2019.
- Invited talk. Houston Big Data Conference (BigDIA), Houston, Texas, December 17-19, 2018.
- Invited talk. SIAM Annual Meeting. Minisymposium on "Machine Learning for Scientific Com-

- puting”, Portland, Oregon, USA, July 9–13, 2018.
- Invited talk. SIAM Conference on Imaging Science. Minisymposium on “Low-dimensional structures in imaging science” and “Graph Techniques for Image Processing”, Bologna, Italy, June 5–8, 2018.
 - Invited talk. Inverse Problems, Imaging and PDEs, IAS, HKUST, Hong Kong, China, March 12–16, 2018.
 - Invited talk. Workshop on Spline Approximation and its Applications on Carl de Boor’s 80th birthday, National University of Singapore, Singapore, December 4–8, 2017.
 - Invited talk and lectures. Data Sciences: bridging mathematics, physics and biology, Institute for Mathematical Sciences, National University of Singapore, Singapore, May 29– June 16, 2017.
 - Invited talk. 10th International Conference on Computational Physics, Macao, China, Jan. 16–20, 2017.
 - Invited talk. International Conference on Some Mathematical Approximation Approaches in Data Science, Zhejiang University, Hangzhou, China, Dec. 12–14, 2016.
 - Invited talk. International Conference on Applied Mathematics 2016, City University of Hong Kong, Hong Kong, China, May 30–June 2, 2016.
 - Invited talk. SIAM Conference on Imaging Science, Albuquerque, NM, USA, May 23–26, 2016.
 - Invited talk. Wavelets and Sparsity XVI, SPIE Optics & Photonics 2015. San Diego, CA, USA, August 9–13, 2015.
 - Invited lecture (with Zuowei Shen). *Wavelet Frames and Applications*, Summer School at Kunming, Yunnan, China, July 13–24, 2015.
 - Invited talk. International Workshop on Signal Processing, Optimization, and Control (SPOC 2014). National University of Defense Technology, Changsha, Hunan, China, Dec 22–26, 2014.
 - Invited talk. Fifth International Conference on Computational Harmonic Analysis (ICCHA5), Nashville, Tennessee, USA, May 19–May 23, 2014.
 - Invited talk. SIAM Conference on Imaging Science, minisymposium on “Computational inversion methods for biomedical imaging ” (M48), Hong Kong Baptist University, Hong Kong, China, May 12–14, 2014.
 - Invited lectures (with Zuowei Shen). Applied Mathematics Summer School, Peking University, Beijing, China, July 8–August 2, 2013.
 - Invited talk. International Workshop on Scientific Computing for Young Chinese Mathematicians, CUHK, Hong Kong, China, March 15–17, 2013.
 - Invited talk. Imaging Science, a workshop in honor of Stanley Osher. Tsinghua University, Beijing, China, December 15–19, 2012.
 - Invited talk. Workshop on Signal Processing, Optimization, and Control, USTC, Hefei, China, July 1–4, 2012.
 - Invited talk. SIAM Conference on Imaging Science, minisymposium on “Sparse and redundant representations for image reconstruction and geometry extraction” (MS67), May 20–22, 2012, Philadelphia, Pennsylvania, USA.
 - Invited talk. Compressive Sensing Workshop: Leveraging Sparsity at UCLA & Beyond, UCLA, March 6–8, 2012.
 - Invited talk, SIAM Conference on Analysis of Partial Differential Equations: Inverse Problems for Density Estimation and Medical Imaging, Nov. 14–Nov. 17, 2011, San Diego, CA, USA.
 - Invited talk, International Workshop on “Recent Advances in Biomedical Imaging”, Shanghai Jiao Tong University, Aug. 15–19, 2011, Shanghai, China.
 - Invited Lecture (with Zuowei Shen), Summer School 2011 on Medical Imaging and Applications, Shanghai Jiao Tong University, July 4–August 12, 2011, Shanghai, China.
 - Invited talk, International Workshop on Image Processing, Computer Vision, Compressive sensing and Related Applications, International Institute for Mathematical Sciences, Dec 16–18, 2010, Seoul, Korea.
 - Invited talk, Mathematical Aspects of Image Processing and Computer Vision 2010, Nov 25–27, 2010, Sapporo, Japan.
 - Invited talk. *Some Mathematical Models in Biomedical Shape Processing and Analysis*, Pacific Rim Mathematics Conference, Mathematical Imaging Session, June 28–July 2, 2010, Stanford

University, California, USA.

- Invited talk. *Surface reconstruction and biomedical shape processing and analysis*, SIAM Conference on Imaging Science, minisymposium on surface reconstruction and shading from sparse gradient fields, April 12-14, 2010, Chicago, Illinois, 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.
- Invited talk. *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.

STUDENTS AND POSTDOCS

Postdocs

- Junbin Huang (2020–) Jointly with Weinan E
- Qi Sun (2019–2021)
- Peichu Xie (2017–2021)
- Haimiao Zhang (2018–2020)

Ph.D Students:

- Haocheng Ju (2021–)
- Zhanhong Ye (2021–)
- Hexin Dong (2020–)
- Zhuoyuan Li (2020–) Jointly with Pingwen Zhang
- Xinyu Xiao (2020–)
- Tianyi Xin (2019–)
- Pengfei Jin (2019–)
- Mo Zhang (2019–) Jointly with Quanzheng Li
- Zhengyi Li (2018–)
- Mingyue Ma (2017–)
- Yutong Xie (2017–) Jointly with Quanzheng Li
- Peiting You (2016–)
- Yuyan Chen (2016–2021) Jointly with Jinchao Xu
- Zichao Long (2015–2020), jointly with Pingwen Zhang

Master Students:

- Mingze Yuan (2021–)
- Yue Zhang (2020–)
- Hao Yu (2020–)
- Yi Zhao (2019–)
- Zifan Chen (2019–)
- Hongyi Shen (2019–) Jointly with Pingwen Zhang
- Xianghui Zhang (2018–) Jointly with Quanzheng Li
- Shaobu Liang (2018–) Jointly with Jinchao Xu
- Weizhen Dian (2018–)
- Chizhou Liu (2018–2021)

- Fei Yu (2018–2021)
- Xue Huang (2018–2021)
- Junyu Liu (2017–2020)
- Ziju Shen (2017–2020)
- Xiao Wang (2017–2020)
- Yini Pan (2016–2019)
- Zejian Wu (2016–2019)
- Xianzhong Ma (2013–2019), jointly with Pingwen Zhang
- Zihan Lei (2015–2018), jointly with Pingwen Zhang

Visiting Students:

- Haimiao Zhang (Wuhan University, 2016–2017)

TEACHING

Beijing International Center for Mathematical Research, Peking University

- **Academic year 2020–2021:**
 - 00100873, Mathematical Image Processing, Fall 2020.
 - 00132860, Learning by Research, Spring, 2020
- **Academic year 2019–2020:**
 - 00100873, Mathematical Image Processing, Fall 2019.
 - 00132860, Learning by Research, Spring, 2019
- **Academic year 2018–2019:**
 - 00100873, Mathematical Image Processing, Fall 2018.
- **Academic year 2017–2018:**
 - 00132860, Learning by Research, Spring, 2018
 - 00131460, Linear Algebra B (for Engineering), Fall 2017.
 - 04630790, Introduction to Data Science, Fall, 2017
 - 08408008, Big Data in Biological and Medical Imaging, Fall, 2017
- **Academic year 2016–2017:**
 - 00100873, Mathematical Image Processing, Spring 2017.
 - 00131460, Linear Algebra B (for Engineering), Fall 2016.
 - 04630790, Introduction to Data Science, Fall, 2016
- **Academic year 2015–2016:**
 - 00100873, Mathematical Image Processing, Spring 2016.
 - 00131460, Linear Algebra B (for Economics), Fall 2015.

Department of Mathematics, University of Arizona

- **Academic year 2013–2014:**
 - MATH 577, Topics in Applied Mathematics: Convex Analysis and Variational Problems, Fall 2013.
 - MATH 575A, Numerical Analysis Part I, Fall 2013.
 - MATH 575B, Numerical Analysis Part II, Spring 2014.
- **Academic year 2012–2013:**
 - MATH 125, Calculus I with Applications, Fall 2012.
 - MATH 575A, Numerical Analysis Part I, Fall 2012.
 - MATH 575B, Numerical Analysis Part II, Spring 2013.
- **Academic year 2011–2012:**
 - MATH 124, Calculus I with Applications, Fall 2011.
 - MATH 322, Mathematical Analysis for Engineers, Spring 2012.

Department of Mathematics, UCSD:

- **Academic year 2010–2011:**
 - MATH 20B, Calculus for Science and Engineering, Fall 2010.
 - MATH 20D, Introduction to Differential Equations, Fall 2010.

- MATH 10B, Calculus, Winter 2011.
- **Academic year 2009–2010:**
 - MATH 20D, Introduction to Differential Equations, Fall 2009.
 - MATH 10B, Calculus, Winter 2010.
 - MATH 170A, Introduction to Numerical Analysis: Linear Algebra, Winter 2010.
 - MATH 170B, Introduction to Numerical Analysis: Approximation and Nonlinear Equations, Spring 2010.