

# Xiaoqing Ye

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## Professional Experience

2024–present	Professor	Georgia State University, Atlanta, Georgia, USA
2019–2024	Associate Professor with Tenure	Georgia State University, Atlanta, Georgia, USA
2013–2019	Assistant Professor	Georgia State University, Atlanta, Georgia, USA
2011–2013	Visiting Assistant Professor	Georgia Institute of Technology, Atlanta, Georgia, USA

## Education

Ph.D.	Mathematics	University of Florida, Gainesville, Florida, USA	2006–2011
M.S.	Statistics	University of Florida, Gainesville, Florida, USA	2007–2009
B.S.	Mathematics	Peking University, Beijing, China	2002–2005

## Research Interests

- Numerical methods and scientific machine learning, e.g., numerical solution to high-dimensional PDEs
- Data-driven and deep-learning based control methods for large-scale computational problems
- Analysis and computational methods for stochastic point processes on large heterogeneous networks
- Optimization methods for inverse problems, image processing and medical imaging

## Research Grants

1. National Science Foundation DMS-2409868 (09/2024–08/2027): On Iteratively Regularized Alternating Minimization under Nonlinear Dynamics Constraints with Applications to Epidemiology. Program: Computational Mathematics. Role: Co-PI.
2. National Science Foundation DMS-2307466 (07/2023–06/2026): Collaborative Research: Theory, Computation and Applications of Parameterized Wasserstein Gradient and Hamiltonian Flows. Program: Applied Mathematics. Role: PI.
3. National Science Foundation DMS-2152960 (04/2022–03/2025): Algorithms for Learning Regularizations of Inverse Problems with High Data Heterogeneity. Program: Computational and Data-Enabled Science and Engineering (CDS&E). Role: PI.
4. National Science Foundation DMS-1925263 (09/2019–08/2022): Algorithms for Point Processes on Networks for Threat Detection. Program: Algorithms for Threat Detection. Role: PI.
5. National Science Foundation DMS-1818886 (09/2018–08/2021): Iteratively Regularized Broyden-Type Algorithms for Nonlinear Inverse Problems. Program: Computational Mathematics. Role: Co-PI.
6. National Science Foundation CMMI-1745382 (09/2017–08/2020): Leveraging Point Processes and Mean Field Games Theory for Simulating Data on Interdependent Critical Infrastructures. Program: Simulated and Synthetic Data for Infrastructure Modeling (SSDIM). Role: Co-PI.

7. National Science Foundation DMS-1620342 (09/2016–08/2019): Collaborative Research: Prediction, Optimization and Control for Information Propagation on Networks: A Differential Equation and Mass Transportation Based Approach. Program: Computational Mathematics. Role: PI.

## Publications

A complete list of publications can be found on [Google Scholar](#).

## Preprints

1. S. Ma, H. Sun, X. Ye, H. Zha, H. Zhou, Learning Cost Functions for Optimal Transport, arxiv:2002.09650.
2. Y. Jin, S. Liu, H. Wu, X. Ye, H. Zhou, Parameterized Wasserstein Gradient Flows, arxiv:2306.00191.
3. N. Gaby, X. Ye, Approximation of Solution Operators for High-dimensional PDEs, arxiv:2401.10385.

## Published and Accepted

1. H. Wu, S. Liu, X. Ye, H. Zhou, Parameterized Wasserstein Hamiltonian Flow, *SIAM Journal on Numerical Analysis (SINUM)*, accepted, 2024.
2. N. Gaby, X. Ye, H. Zhou, Neural Control of Parametric Solutions for High-dimensional Evolution PDEs, *SIAM Journal on Scientific Computing (SISC)*, 46(3), C155-C185, 2024.
3. A. Smirnova, X. Ye, On optimal control at the onset of a new viral outbreak, *Infectious Disease Modelling*, 9(4), 995-1006, 2024.
4. A. Smirnova, M. Baroonian, X. Ye, Optimal Epidemic Control with Nonmedical and Medical Interventions, *Mathematics Special Issue on Mathematical Methods and Models in Epidemiology*, 12(18), 2024.
5. Q. Zhang, M. Alvandipour, W. Xia, Y. Zhang, X. Ye, Y. Chen, Provably Convergent Learned Inexact Descent Algorithm for Low-Dose CT Reconstruction, *Journal of Scientific Computing*, 101(1), 1-26, 2024.
6. S. Ma, M. Hou, X. Ye, H. Zhou, High-dimensional Optimal Density Control with Wasserstein Metric Matching, *IEEE Conference on Decisions and Control (CDC)*, 2023.
7. Z. Tang, T.-H. Chang, X. Ye, H. Zha, Low-rank Matrix Recovery With Unknown Correspondence, *Uncertainty in Artificial Intelligence (UAI)*, accepted, 2023.
8. C. Ding, Q. Zhang, X. Ye, Y. Chen, Learned Alternating Minimization Algorithm for Dual-domain Sparse-View CT Reconstruction, *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, accepted, 2023.
9. N. Gaby, F. Zhang, X. Ye, Lyapunov-net: A deep neural network architecture for Lyapunov function approximation, *IEEE Conference on Decision and Control (CDC)*, pp.2091–2096, 2022.
10. W. Bian, Y. Chen, X. Ye, A Learnable Variational Model for Joint Multimodal MRI Reconstruction and Synthesis, *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp.354–364, 2022.
11. Q. Zhang, X. Ye, Y. Chen, Extra Proximal-Gradient Network with Learned Regularization for Image Compressive Sensing Reconstruction, *Journal of Imaging*, 8 (7), 178, 2022.
12. W. Bian, Y. Chen, X. Ye, An Optimal Control Framework for Joint-channel Parallel MRI Reconstruction without Coil Sensitivities, *Magnetic Resonance Imaging*, 89, 1-11, 2022.

13. Y. Chen, H. Liu, X. Ye, Q. Zhang, Learnable Descent Algorithm for Nonsmooth Nonconvex Image Reconstruction, *SIAM Journal on Imaging Sciences (SIIMS)*, 14(4), 1532-1564, 2021.
14. W. Bian, Y. Chen, X. Ye, Q. Zhang, An Optimization-Based Meta-Learning Model for MRI Reconstruction with Diverse Dataset, *Journal of Imaging*, 7(11), 231, 2021.
15. Q. Zhang, X. Ye, Y. Chen, Nonsmooth nonconvex LDCT image reconstruction via learned descent algorithm, *Developments in X-Ray Tomography XIII*, 11840, 2021.
16. Y. Chen, X. Ye, Q. Zhang, (Book chapter) Variational Model-Based Deep Neural Networks for Image Reconstruction, *Handbook of Mathematical Models and Algorithms in Computer Vision and Imaging: Mathematical Imaging and Vision*, Springer International Publishing, 2021.
17. Y. Xie, Y. Mao, S. Zuo, H. Xu, X. Ye, T. Zhao, H. Zha, A Hypergradient Approach to Robust Regression without Correspondence, *International Conference on Learning Representation (ICLR)*, 2021.
18. S. He, H. Zha, X. Ye, Network Diffusions via Neural Mean-Field Dynamics, *Advances in Neural Information Processing Systems (NeurIPS)*, 2020.
19. G. Bao, X. Ye, Y. Zang, H. Zhou, Numerical Solution of Inverse Problems by Weak Adversarial Networks, *Inverse Problems*, 36(11), 115003, 2020.
20. Y. Chen, X. Ye, Q. Zhang, Variational Model with Optimization Algorithm, *Handbook of Mathematical Models and Algorithms in Computer Vision and Imaging*, Springer, 2020.
21. W. Bian, Y. Chen, X. Ye, Deep Parallel MRI Reconstruction Network Without Coil Sensitivities, *MICCAI Workshop Machine Learning for Medical Image Reconstruction*, 2020.
22. Y. Zang, G. Bao, X. Ye, H. Zha, H. Zhou, A Jump Stochastic Differential Equation Approach for Influence Prediction on Information Propagation Networks, *Communications in Mathematical Sciences*, 18(8), pp. 2341-2359, 2020.
23. Y. Chen, X. Ye, W. Zhang, Acceleration Techniques for Level Bundle Methods in Weakly Smooth Convex Constrained Optimization, *Computational Optimization and Applications*, 77, pp. 411-432, 2020.
24. Y. Zang, G. Bao, X. Ye, H. Zhou, Weak Adversarial Networks for High-dimensional Partial Differential Equations, *Journal of Computational Physics (JCP)*, 411(15), 109409, 2020.
25. C. Chen, Y. Chen, X. Ye, A Randomized Incremental Primal Dual Method for Decentralized Consensus Optimization, *Analysis and Applications*, 1-25, 2019.
26. Y. Chen, B. Li, X. Ye, A Two-stage Algorithm for Joint Multimodal Image Reconstruction, *SIAM Journal on Imaging Sciences (SIIMS)*, 12(3). pp. 1425-1463, 2019.
27. R. Li, X. Ye, H. Zhou, H. Zha, Learning to Match via Inverse Optimal Transport, *Journal of Machine Learning Research*, 20, pp. 1-37, 2019.
28. S.-N. Chow, X. Ye, H. Zha, H. Zhou, Influence Prediction for Continuous-Time Information Propagation on Networks, *Networks and Heterogenous Media*, 13(4), pp. 567-583, 2018.
29. J. Yang, X. Ye, R. Trivedi, H. Xu, H. Zha, Learning Deep Mean Field Games for Modeling Large Population Behavior, *International Conference on Learning Representation (ICLR)*, 2018.
30. B. Sirb, X. Ye, Decentralized Consensus Algorithm with Delayed and Stochastic Gradients, *SIAM Journal on Optimization (SIOPT)*, 28(2), pp. 1232-1254, 2018.
31. S. Xiao, M. Farajtabar, X. Ye, J. Yan, L. Song, H. Zha, Wasserstein Learning of Deep Generative Point Process Models, *Advances in Neural Information Processing Systems (NIPS)*, accepted, 2017.

32. Y. Wang, X. Ye, H. Zha, L. Song, Predicting User Activity Level In Point Process Models With Mass Transport Equation, *Advances in Neural Information Processing Systems (NIPS)*, accepted, 2017.
33. M. Farajtabar, J. Yang, X. Ye, H. Xu, R. Trivedi, E. Khalil, S. Li, L. Song, H. Zha, Fake News Mitigation via Point Process Based Intervention, *International Conference on Machine Learning (ICML)*, *PMLR*, 70, pp. 1097-1106, 2017.
34. Y. Wang, X. Ye, H. Zhou, H. Zha, L. Song, Linking Micro Event History to Macro Prediction in Point Process Models *Artificial Intelligence & Statistics (AISTATS)*, *PMLR*, 54, pp. 1375-1384, 2017.
35. L. Zhao, W.-Z. Song, X. Ye, Y. Gu, Asynchronous Broadcast-based Decentralized Learning in Sensor Networks, *International Journal of Parallel, Emergent and Distributed Systems*, pp. 1-19, 2017.
36. B. Sirb, X. Ye, Consensus Optimization with Delayed and Stochastic Gradients on Decentralized Networks, *IEEE International Conference on Big Data*, pp. 76-85, 2016.
37. M. Farajtabar, X. Ye, S. Harati, L. Song, H. Zha, Multistage Campaigning in Social Networks, *Advances in Neural Information Processing Systems (NIPS)*, 29, pp. 4718-4726, 2016.
38. S.-N. Chow, X. Ye, and H. Zhou, Potential Induced Random Teleportation on Finite Graphs, *Computational Optimization and Applications*, 61(3), pp. 689-711, 2015.
39. L. Zhao, W.-Z. Song, L. Shi, and X. Ye, Decentralised Seismic Tomography Computing in Cyber-Physical Sensor Systems, *Cyber-Physical Systems*, 1 (2-4), pp. 91-112, 2015.
40. X. Ye, Distributed Consensus Optimization for Nonsmooth Image Reconstruction, *Journal of the Operations Research Society of China*, 3(2), pp. 117-138, 2015.
41. L. Zhao, W.-Z. Song, and X. Ye, Fast Decentralized Gradient Descent Method and Applications to In-situ Seismic Tomography, *IEEE Proceedings of International Conference on Big Data (BigData'15)*, pp. 908-917, 2015.
42. T. Niu, X. Ye, Q. Fruhauf, M. Petrongolo, and L. Zhu, Accelerated barrier optimization compressed sensing (ABOCS) for CT reconstruction with improved convergence, *Physics in Medicine and Biology*, 59, pp. 1801-1814, 2014.
43. M. Liu, Y. Chen, Y. Ouyang, X. Ye, and F. Huang, An Enhanced Approach for Simultaneous Image Reconstruction and Sensitivity Map Estimation in Partially Parallel Imaging, *IEEE Proceedings of International Conference of Image Processing (ICIP'13)*, pp. 2314-2318, 2013.
44. X. Ye and H. Zhou, Fast Total Variation Wavelet Inpainting via Approximated Primal Dual Hybrid Gradient Algorithm, *Inverse Problems and Imaging*, 7(3), pp. 1031-1050, 2013.
45. H. Zhang, X. Ye, and Y. Chen, An Efficient Algorithm for Multiphase Image Segmentation with Intensity Bias Correction, *IEEE Transactions on Image Processing*, 22(10), pp. 3842-3851, 2013.
46. Y. Chen, W. W. Hager, M. Yashtini, X. Ye, and H. Zhang, Bregman Operator Splitting With Variable Stepsize for Total Variation Image Reconstruction, *Computational Optimization and Applications*, 54(2), pp. 317-342, 2013.
47. H. Zhang, Y. Chen, and X. Ye, A Variational Multiphase Model for Simultaneous MR Image Segmentation and Bias Correction *IEEE Proceedings of International Conference of Image Processing (ICIP'13)*, pp. 2037-2040, 2012.
48. M. Yashtini, W. W. Hager, Y. Chen, and X. Ye, Parallel MR Image Reconstruction Using Sensitivity Encoding, *IEEE Proceedings of International Conference of Image Processing (ICIP'12)*, pp. 2077-2080, 2012.
49. Y. Chen, W. W. Hager, F. Huang, D. Phan, X. Ye and W. Yin, Fast Algorithms for Image Reconstruction with Application to Partially Parallel MR Imaging, *SIAM Journal on Imaging Sciences (SIIMS)*, 5(1), pp. 90-118, 2012.

50. Y. Chen and X. Ye, Modeling and Computations in Image Registration, *Mathematical Modeling and Its Applications*, 1(1), pp. 26-37, 2012.
51. X. Ye, Y. Chen, and F. Huang, Computational Acceleration for MR Image Reconstruction in Partially Parallel Imaging, *IEEE Transactions on Medical Imaging*, 30(5), pp. 1055-1063, 2011.
52. X. Ye, Y. Chen, W. Lin, and F. Huang, Fast MR Image Reconstruction for Partially Parallel Imaging with Arbitrary  $k$ -Space Trajectories, *IEEE Transactions on Medical Imaging*, 30(3), pp. 575-585, 2011.
53. M. Liu, K. Liu and X. Ye, Efficient Minimization for Dictionary Based Sparse Representation and Signal Recovery, *ACM Proceedings of the International Symposium on Applied Sciences in Biomedical and Communication Technologies*, 105, pp. 1-5, 2011.
54. M. Liu, K. Liu, and X. Ye, Find the Intrinsic Space for Multiclass Classification, *ACM Proceedings of the International Symposium on Applied Sciences in Biomedical and Communication Technologies*, 106, pp. 1-5, 2011.
55. M. Liu, L. Lu, X. Ye and S. Yu, Coarse-to-fine Classification Using Parametric and Nonparametric Models for Computer-Aided Diagnosis, *Proceedings of the 20th ACM Conference on Information and Knowledge Management (CIKM'11)*, pp. 2509-2512, 2011.
56. M. Liu, L. Lu, X. Ye, S. Yu, and M. Salganicoff, Sparse Classification for Computer Aided Diagnosis Using Learned Dictionaries *Proceedings of the 14th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI'11)*, 3, pp. 41-48, 2011.
57. Y. Chen, X. Ye, and F. Huang, A Novel Method and Fast Algorithm for MR Image Reconstruction with Significantly Under-Sampled Data, *Inverse Problems and Imaging*, 4(2), pp. 223-240, 2010.
58. F. Huang, Y. Chen, W. Yin, W. Lin, X. Ye, W. Guo, A. Reykowski, A Rapid and Robust Method for Sensitivity Encoding with Sparsity Constraints: Self-feeding Sparse SENSE, *Magnetic Resonance in Medicine*, 64(4), pp. 1078-1088, 2010.
59. Y. Chen and X. Ye, Inverse Consistent Deformable Image Registration, pp. 419-440, *Development of Mathematics – The Legacy of Alladi Ramakrishnan in the Mathematical Sciences*, K. Alladi, J. Klauder and C.R. Rao (Eds.), Springer-Verlag, 2010.
60. X. Ye and Y. Chen, A New Algorithm for Inverse Consistent Image Registration, *Proceedings of International Symposium on Visual Computing (ISVC'09), Part I, Lecture Notes in Computer Science (LNCS) 5875, Springer-Verlag, Berlin-Heidelberg*, pp. 855-864, 2009.
61. X. Ye, Y. Chen, and F. Huang, MR Image Reconstruction via Sparse Representation: Modeling and Algorithm, *Proceedings of International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV'09)*, pp. 10-16, 2009.
62. X. Ye and Y. Chen, Improvement of Accuracy in Deformable Image Registration in Radiation Therapy, *Proceedings of IEEE International Conference on Image Processing (ICIP'08)*, pp. 2420-2423, 2008.

## Books

1. G. Wang, Y. Zhang, X. Ye, X. Mou, Machine Learning for Tomographic Imaging, *Institute of Physics (IOP) Publishing*, 2019.
2. X. Ye, Mathematical Foundations of Deep Learning, under contract with Taylor & Francis Press, in preparation and to appear in early 2026.

## Thesis

1. *Ph.D. Dissertation*, Mathematical Models and Fast Numerical Algorithms for Medical Image Analysis, University of Florida, 2011.
2. *B.S. Thesis*, An  $L^\infty$  bound for the Neumann Problem of the Poisson Equations, Peking University, 2005.

## Professional Activities

- Associate Editor, AIMS Inverse Problems and Imaging, Jan. 2023–present
- Panelist, National Science Foundation, USA
- External Reviewer, Research Grant Council, Hong Kong, China
- External Reviewer, French National Research Agency, France
- Senior Program Committee, International Joint Conferences on Artificial Intelligence (IJCAI 2019–2021)