Wei GONG

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Chinese Academy of Sciences
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Personal Information

Date of Birth: 13 May, 1981, in Xin-yang, He-nan; married, one child.

Employment

Chinese Academy of Sciences, Academy of Mathematics and Systems Science, Institute of Computational Mathematics, China, Associate Professor, March 2017–present.

Chinese Academy of Sciences, Academy of Mathematics and Systems Science, Institute of Computational Mathematics, China, Assistant Professor, July 2009–February 2017.

Hamburg University, Department of Mathematics, Germany, Postdoc, Alexander von Humboldt Fellowship, September 2010–May 2012.

Education

Ph.D. Computational Mathematics, Academy of Mathematics and Systems Science, CAS, 2009.

M.A. Computational Mathematics, Zhengzhou University, 2006.

B.S. Applied Mathematics, Zhengzhou University, 2003.

Academic Visit

The Hong Kong Polytechnic University, Department of Applied Mathematics, Hong Kong, June 14-24, 2018.

HongKong Baptist University, Department of Mathematics, Research Associate, June 2014–July 2014.

Awards

Chen Jing-run Future Star: Academy of Mathematics and Systems Science, Chinese Academy of Sciences, 2017.

Humboldt Fellow: Humboldt foundation, Germany, September 2010–May 2012.

Editorial Activities

Computational and Applied Mathematics, Springer: Associate Editor, 2022–present.

Grants

PI, National Natural Science Foundation of China, 12071468: January 2021–December 2024.

PI, National Natural Science Foundation of China, 11671391: January 2017–December 2020.

PI, National Natural Science Foundation of China, 11201464: January 2013–December 2015.

PI, Scientific Research Foundation for the Returned Overseas Chinese Scholars, State Education Ministry: January 2013–December 2015.

Participant, The Strategic Priority Research Program of Chinese Academy of Sciences, Grant No. XDB 41000000: January 2020–December 2024.

Participant, The National Key Basic Research Program, Grant No. 2018YFB0704304: July 2018–June 2022.

Participant, National Natural Science Foundation of China, key project, 91530204: January 2016–December 2018.

Participant, National Natural Science Foundation of China, 91330115: January 2014–December 2014.

Participant, National Basic Research Program of China, 2012CB821204: January 2013–July 2016.

Research

Research Interests: Finite element method, PDE-constrained optimization, Numerical analysis, Data assimilation, Shape and topology optimization.

Preprints, Papers Under Review or Revision

1. Gang Chen, Wei Gong, Mariano Mateos, John R. Singler and Yangwen Zhang (2022). A new global divergence free and pressure-robust HDG method for tangential boundary control of Stokes equations. arXiv:2203.04589.
2. Wei Gong, Felix Kwok and Zhiyu Tan (2022). Convergence analysis of the Schwarz alternating method for elliptic optimal control problems. arXiv:2201.00974.
3. Wei Gong, Dongdong Liang and Xiaoping Xie (2021). Pointwise error estimates for linear finite element approximation to elliptic Dirichlet problems in smooth domains. Preprint
4. Wei Gong, Ningning Yan and Zhaojie Zhou (2016). Convergence of L^2-norm based adaptive finite element method for elliptic optimal control problems. Preprint
5. Wei Gong, Xiliang Lu and Ningning Yan (2014). A parareal in time algorithm for the optimal control of evolution equations. Preprint.

Peer-Reviewed Journal Articles

1. Lili Chang, Wei Gong, Zhen Jin and Guiquan Sun (2022). Sparse optimal control of pattern formations for an SIR reaction-diffusion epidemic model, accepted to *SIAM Journal on Applied Mathematics*.
2. Wei Gong, Buyang Li and Huanhuan Yang (2022). Optimal control in a bounded domain for wave propagating in the whole space: coupled through boundary integral equations, *Journal of Scientific Computing*, Vol. 92, Paper No. 91, 52pp.
3. Wei Gong, Jiajie Li and Shengfeng Zhu (2022). Improved discrete boundary type shape gradients for PDE-constrained shape optimization, *SIAM Journal on Scientific Computing*, 44(4), A2464-A2505.
4. Yue Shen, Wei Gong and Ningning Yan (2022). Convergence of adaptive nonconforming finite element method for Stokes optimal control problems, *Journal of Computational and Applied Mathematics*, 412, Paper No. 114336.
5. Kaiye Zhou and Wei Gong (2022). Error estimates for finite element approximation of Dirichlet boundary control for Stokes equations in $L^2(\Gamma)$, *Journal of Scientific Computing*, 91(2), Paper No. 45.

6. Wei Gong, Zhiyu Tan and Zhaojie Zhou (2022). Optimal convergence of finite element approximation to an optimization problem with PDE constraint, *Inverse Problems*, 38(4), Paper No. 045004, 45 pp.
7. Dongdong Liang, Wei Gong and Xiaoping Xie (2022). Finite element error estimation for parabolic optimal control problems with pointwise observations. *Numerical Mathematics: Theory, Methods and Applications*, 15(1), 165-199.
8. Wei Gong, Mariano Mateos, John R. Singler and Yangwen Zhang (2022). Analysis and approximations of Dirichlet boundary control of Stokes flows in the energy space, arXiv:2011.08221, *SIAM Journal on Numerical Analysis*, 60(1), 450-474.
9. Wei Gong and Shengfeng Zhu (2021). On discrete shape gradient of boundary type for PDE-constrained shape optimization. *SIAM Journal on Numerical Analysis* 59(2021), no. 3, 1510-1541.
10. Wei Gong, Weiwei Hu, Mariano Mateos, John Singler and Yangwen Zhang (2020). Analysis of an hybridizable discontinuous Galerkin scheme for the tangential control of the Stokes system. *ESAIM Mathematical Modelling and Numerical Analysis* 54(2020), no. 6, 2229-2264.
11. Wei Gong and Buyang Li (2020). Improved error estimates for semi-discrete finite element solutions of parabolic Dirichlet boundary control problems. *IMA Journal of Numerical Analysis* 40(2020), no. 4, 2898-2939.
12. Wei Gong, Wenbin Liu, Zhiyu Tan and Ningning Yan (2019). A convergent adaptive finite element method for elliptic Dirichlet boundary control problem. *IMA Journal of Numerical Analysis* 39(2019), no. 4, 1985-2015.
13. Wei Gong, Weiwei Hu, Mariano Mateos, John R. Singler, Xiao Zhang and Yangwen Zhang (2018). A new HDG method for Dirichlet boundary control of convection diffusion PDEs II: low regularity *SIAM Journal on Numerical Analysis* Vol. 56, No. 4, pp. 2262-2287.
14. Wei Gong, Zhiyu Tan and Shuo Zhang (2018). A robust optimal preconditioner for the mixed finite element discretization of elliptic optimal control problems. *Numerical Linear Algebra with Applications* 25(1): e2129.
15. Wei Gong, Huipo Liu and Ningning Yan (2018). Adaptive finite element method for parabolic equations with Dirac measure. *Computer Methods in Applied Mechanics and Engineering* 328, 217-241.
16. Zhiyu Tan, Wei Gong and Ningning Yan (2017). Overlapping domain decomposition preconditioners for unconstrained elliptic optimal control problems. *International Journal of Numerical Analysis and Modeling* 14(4-5), 550-570.
17. Wei Gong, Hehu Xie and Ningning Yan (2017). Adaptive multilevel correction method for finite element approximations of elliptic optimal control problems. *Journal of Scientific Computing* 72(2), 820-841. DOI 10.1007/s10915-017-0386-y.
18. Wei Gong and Ningning Yan (2017). Adaptive finite element method for elliptic optimal control problems: convergence and optimality. *Numerische Mathematik* 135(4), 1121-1170. DOI:10.1007/s00211-016-0827-9.
19. Lili Chang, Wei Gong and Ningning Yan (2017). Weak boundary penalization for Dirichlet boundary control problems governed by elliptic equations. *Journal of Mathematical Analysis and Applications* 453 (1), 529-557.
20. Wei Gong and Ningning Yan (2016). Finite element approximations of parabolic optimal control problems with controls acting on a lower dimensional manifold. *SIAM Journal on Numerical Analysis* 54(2), 1229-1262.
21. Wei Gong, Michael Hinze and Zhaojie Zhou (2016). Finite element method and a priori error estimates for Dirichlet boundary control problems governed by parabolic PDEs. *Journal of Scientific Computing* 66(3), 941–967. DOI: 10.1007/s10915-015-0051-2.

22. Zhaojie Zhou and Wei Gong (2016). Finite element approximation of optimal control problems governed by time fractional diffusion equation. *Computers & Mathematics with Applications* 71(1), 301-318.
23. Wei Gong and Ningning Yan (2016). Finite element method and its error estimates for the time optimal controls of heat equation. *International Journal of Numerical Analysis and Modeling* 13(2), 261–275.
24. Wei Gong, Hehu Xie and Ningning Yan (2015). A multilevel correction method for optimal controls of elliptic equation. *SIAM Journal on Scientific Computing* 37(5), A2198–A2221.
25. Lili Chang, Wei Gong, Guiquan Sun, and Ningning Yan (2015). PDE-constrained optimal control approach for the approximation of an inverse Cauchy problem. *Inverse Problems and Imaging* 9(3), 791–814.
26. Dongyang Shi, Qili Tang and Wei Gong (2015). A low order characteristic-nonconforming finite element method for nonlinear Sobolev equation with convection-dominated term. *Mathematics and Compututers in Simulation* 114, 25–36.
27. Wei Gong, Huipo Liu and Ningning Yan (2015). High accuracy analysis of finite element methods for optimal control problems and its application (in Chinese). *Sci. Sin. Math.* 45, 953–974. Dedicated to the 80-th birthday of prof. Qun LIN.
28. Lili Chang, Wei Gong and Ningning Yan (2015). Numerical analysis for the approximation of optimal control problems with pointwise observations. *Mathematical Methods in the Applied Sciences*, 38, 4502-4520, DOI:10.1002/mma.2861.
29. Min Yan, Wei Gong and Ningning Yan (2015). Finite element methods for elliptic optimal control problems with boundary observations. *Applied Numerical Mathematics* 90, 190–207.
30. Wei Gong, Gengsheng Wang and Ningning Yan (2014). Approximations of elliptic optimal control problems with controls acting on a lower dimensional manifold. *SIAM Journal on Control and Optimization* 52(3), 2008–2035.
31. Wei Gong, Michael Hinze and Zhaojie Zhou (2014). A priori error analysis for finite element approximation of parabolic optimal control problems with pointwise control. *SIAM Journal on Control and Optimization* 52(1), 97–119.
32. Wei Gong and Michael Hinze (2013). Error estimates for parabolic optimal control problems with control and state constraints. *Computational Optimization and Applications* 56(1), 131–151.
33. Wei Gong (2013). Error estimates for finite element approximations of parabolic equations with measure data. *Mathematics of Computation* 82, 69–98.
34. Wei Gong, Michael Hinze and Zhaojie Zhou (2012). Space-time finite element approximation of parabolic optimal control problems. *Journal of Numerical Mathematics* 20, 111–145.
35. Dongyang Shi, Jincheng Ren and Wei Gong (2012). Convergence and super convergence analysis of a nonconforming finite element method for solving the Signorini problems. *Nonlinear Analysis: Theory, Methods & Applications* 75, 3493–3502.
36. Wei Gong and Ningning Yan (2011). Mixed finite element method for Dirichlet boundary control problem governed by elliptic PDEs. *SIAM Journal on Control and Optimization* 49(3), 984–1014.
37. Wei Gong, Ningning Yan (2011). Robust error estimates for the finite element approximation of elliptic optimal control problems. *Journal of Computational and Applied Mathematics* 236, 1370–1381.
38. Dongyang Shi, Jinchen Ren and Wei Gong (2011). A new nonconforming mixed finite element scheme for the stationary Navier-Stokes equations. *Acta Mathematica Scientia* 31, 367–382.
39. Dongyang Shi, Wei Gong and Jincheng Ren (2011). A new stable second order nonconforming mixed finite element scheme for the stationary Stokes and Navier-Stokes equations. *Mathematical and Computer Modelling* 53, 1956–1969.

40. Wei Gong and Ningning Yan (2011). A mixed finite element scheme for optimal control problems with pointwise state constraints. *Journal of Scientific Computing* 46(2), 182–203.
41. Wei Gong, Wenbin Liu and Ningning Yan (2011). A posteriori error estimates of hp-FEM for optimal control problems. *International Journal of Numerical Analysis and Modeling* 8, 48–69.
42. Lili Chang, Wei Gong and Ningning Yan (2010). Finite element method for a nonsmooth elliptic equation. *Frontiers of Mathematics in China* 5(2), 191–209.
43. Dongyang Shi and Wei Gong (2009). High accuracy analysis of fully discrete Galerkin approximations for parabolic equations on anisotropic meshes(Chinese). *Acta Mathematica Scientia Series A Chinese Edition* 29, 898–911.
44. Dongyang Shi and Wei Gong (2009). A low order nonconforming anisotropic finite element approximation to parabolic problem. *Journal of Systems Science and Complexity* 22, 518–532.
45. Wenbin Liu, Wei Gong and Ningning Yan (2009). A new finite element approximation of a state-constrained optimal control problem. *Journal of Computational Mathematics* 27, 97–114.
46. Wei Gong and Ningning Yan (2009). A posteriori error estimates for boundary control problems governed by the parabolic partial differential equations. *Journal of Computational Mathematics* 26, 68–88.
47. Wei Gong, Ruo Li, Ningning Yan and Weibo Zhao (2008). An improved error analysis for finite element approximation of bioluminescence tomography. *Journal of Computational Mathematics* 26, 297–309.
48. Dongyang Shi and Wei Gong (2007). Nonconforming finite element approximations to a hyperbolic equation on anisotropic meshes (Chinese). *Math. Appl.(Wuhan)* 20, 196–202.

Other Publications

49. Wei Gong, Ruo Li, Ningning Yan and Weibo Zhao (2008). Numerical simulation of Bioluminescence Tomography. *Proceedings of the 28th Chinese Control Conference* Vol. 2, 585–588, July 16-18, 2008, Kunming, Beijing.
50. Lili Chang, Wei Gong and Ningning Yan (2010). Discontinuous Galerkin methods for distributed control problems of a scalar hyperbolic equation. *Proceedings of the 29th Chinese Control Conference* P. 6052-6055, July 29-31, 2010, Beijing, China.

Invited Seminar Presentations

2012: Seminar, February, University of Hamburg, Germany.

2012: Seminar Nonlinear Optimization and Inverse Problems, May 8, WIAS, Berlin, Germany. Title: *Finite Element Approximation to Parabolic Boundary Control Problems of Dirichlet Type*

2012: Wuhan University, November 12, Wuhan, China. Title: *Finite Element Methods for Elliptic and Parabolic Dirichlet Boundary Control Problems*

2014: Wuhan University, November 12, Wuhan, China. Title: *A Multilevel Correction Method for Optimal Controls of Elliptic Equation*

2014: Institute of Applied Physics and Computational Mathematics, November 20, Beijing, China. Title: *Parabolic OCPs with Controls Acting on a Lower Dimensional Manifold: Theory and Numerics*

2015: Wuhan University, March 14, Wuhan, China. Title: *Approximations of Parabolic OCPs with Controls Acting on A Lower Dimensional Manifold*

2015: Institute of Applied Physics and Computational Mathematics, November 17, Beijing, China. Title: *A Multilevel Correction Method for Optimal Controls of Elliptic Equation*

2016: Shandong Normal University, December 4, Jinan, China. Title: *Adaptive Finite Element Method for Parabolic Equations with Dirac Measure*

2017: Institute of Applied Physics and Computational Mathematics, August 17, Beijing, China. Title: *Adaptive Finite Element Method for Parabolic Equations with Dirac Measure*

2018: Henan University of Economics and Law, May 25, Zhengzhou, China. Title: *Approximations of Dirichlet Boundary Control Problems*

2018: Zhengzhou University, May 28, Zhengzhou, China. Title: *Finite Element Method for Partial Differential Equations with Rough/Singular Data*

2018: Dalian University of Technology, December 29, Dalian, China. Title: *Recent Advances in PDE-constrained Optimization and Optimal Control*

2019: Xinjiang University, July 25, Xinjiang, China. Title: *Analysis and Approximations of Dirichlet Boundary Control of Stokes Flow in Energy Space*

2019: Xinyang Normal University, October 11, Xinyang, Henan, China. Title: *Convergence Analysis of the Schwarz Alternating Method for Elliptic Optimal Control Problems*

2019: China University of Petroleum, 21 November, Qingdao, Shandong, China. Title: *PDE-constrained Optimal Control: Theory and Numerics*

2019: Shandong Normal University, 25 November, Jinan, Shandong, China. Title: *PDE-constrained Optimal Control: Theory and Numerics*

2020: Nanjing Normal University, 19 November, Nanjing, Jiangsu, China. Title: *Analysis and Approximations of Dirichlet boundary Control of Stokes flows in the energy space*, online talk.

2021: Sichuan University, 22 January, Chengdu, Sichuan, China. Title: *On discrete shape gradients of boundary type for PDE-constrained shape optimization*, online talk.

2021: Nuclear Power Institute of China, 16 April, Chengdu, Sichuan, China. Title: *PDE-constrained optimization and data assimilation*

2021: Henan Polytechnic University, 17 May, Jiaozuo, Henan, China. Title: *On discrete shape gradients of boundary type for PDE-constrained shape optimization*

2021: Shandong University, 23 November, 2021, China. Title: *Optimal convergence of finite element approximations to an optimization problem with PDE constraint*

2021: Jilin University, 8 December, 2021, China. Title: *Optimal convergence of finite element approximations to an optimization problem with PDE constraint*

2022: Zhengzhou University, 21 January, online talk, Henan, China. Title: *On discrete shape gradients of boundary type for PDE-constrained shape optimization*

2022: HongKong Polytechnical University, 15 February, online talk, HK, China. Title: *On discrete shape gradients of boundary type for PDE-constrained shape optimization*

2022: Ji'nan University, 6 April, online talk, China. Title: *On discrete shape gradients of boundary type for PDE-constrained shape optimization*

2022: Zhengzhou University of Light Industry, 24 May, online talk, China. Title: *On discrete shape gradients of boundary type for PDE-constrained shape optimization*

2022: Zhengzhou University, 7 July, 2022, China. Title: *Optimal convergence of finite element approximations to an optimization problem with PDE constraint*

Invited Conference Presentations

2013: Invited talk, Workshop on Computational Mathematics for Youth, August 9-11, Zhengzhou University, Zhengzhou, China. Title: *OCP with PDE Constraints: An Introduction*

2014: Invited talk, Workshop on Data Assimilation and Inverse Problems, October 23-24, Beijing, China. Title: *Recent Advance in Numerical Methods for PDE-constrained Optimizations*

2015: Invited talk, International Conference on Control Problem with PDE Constraints and Interface Problems, June 10-12, 2015, Nanjing Normal University, Nanjing, China. Title: *Adaptive Finite Element Method for Elliptic Optimal Control Problems: Convergence and Optimality*

2015: Invited talk, The 5th Chinese-German Workshop on Computational and Applied Mathematics, September 20-26, 2015, University of Augsburg, Augsburg, Germany. Title: *A Parareal in Time Algorithm for The Optimal Control of Evolution Equations*

2015: Invited talk, The 4th Chinese-Russian Workshop on Numerical Mathematics and Scientific Computing, October 25-27, 2015, Tianjin University of Economics and Finance, Tianjin, China. Title: *Convergence of Adaptive Finite Element Method for Optimal Control of Elliptic Equations*

2015: Invited talk, Workshop on the Simulations and Analysis in Computational Physics, December 27-28, 2015, Peking University, Beijing, China. Title: *Finite Element Method for Partial Differential Equations with Rough/Singular Data*

2016: Invited talk, Workshop on Computational Mathematics, April 21-24, 2016, Zhengzhou University, Zhengzhou, China. Title: *A Multilevel Correction Method for Optimal Controls of Elliptic Equation*

2017: Invited talk, Peking University, SIAM student chapter, April 15, Beijing, China. Title: *Recent Advance in Adaptive Finite Element Method for PDE-constrained Optimal Controls*

2017: Invited talk, Workshop of Numerical PDEs, June 17-18, 2017, Nanjing University, Nanjing, China. Title: *Adaptive Finite Element Method for PDE-constrained Optimal Controls: Error Estimates and Convergence*

2017: Minisymposium talk, SIAM Conference on Control and its Applications, July 10-12, Pittsburgh, USA. Title: *Optimal Control of PDEs with Controls from a Lower Dimensional Manifold and Its Approximations*

2017: Invited talk, International Workshop on Numerical Analysis of Differential and Integral Equations, August 20-23, Heilongjiang University, Harbin, China. Title: *Adaptive Finite Element Method for Parabolic Equations with Dirac Measure*

2017: Invited talk, The 3th Workshop on Scientific and Engineering Computing for Youths, September 28-29, Chinese Academy of Sciences, Beijing, China. Title: *Approximations of Dirichlet Boundary Control Problems*

2017: Invited talk, The 6th Chinese-German Workshop on Computational and Applied Mathematics, October 9-13, TongJi University, Shanghai, China. Title: *Convergence of Adaptive Finite Element Method for Elliptic Optimal Control Problems*

2017: Invited talk, Chinese Mathematical Society 2017 Annual Conference, October 20-24, Xiangtan University, Hunan, China. Title: *Approximations of Dirichlet Boundary Control Problems*

2018: Invited talk, Forum on Computational Methods for Application Driven Problems, March 16-18, Institute of Applied Physics and Computational Mathematics, Beijing, China. Title: *Approximations of Dirichlet Boundary Control Problems*

2018: Invited talk, International Workshop on Scientific Computing in Multi-Physics Problems, May 25-27, Zhengzhou University, Zhengzhou, China. Title: *Analysis and Approximations of Optimal Dirichlet Boundary Control of Stokes Flow*

2018: Invited talk, Forum on Scientific Computing and Engineering Applications, July 18-20, North China Electric Power University, Baoding, China. Title: *Analysis and Approximations of Optimal Dirichlet Boundary Control of Stokes Flow*

2018: Minisymposium talk, IFIP TC 7 Conference on System Modelling and Optimization, Essen, Germany, July 23-27. Title: *Convergence of adaptive finite element method for PDE-constrained optimal control problems*

2018: Invited talk, Summer School on Applied Mathematics, August 1, Xiangtan University, Xiangtan, China. Title: *Analysis and Approximations of Dirichlet Boundary Control Problems for PDEs*

2018: Minisymposium talk, Annual Meeting on Computational Mathematics for Beijing-Tianjin-Hebei, August 24-27, Hengshui, Hebei, China. Title: *An HDG Method for Tangential Boundary Control of Stokes Equations*

2018: Invited talk, Frontiers of Methods and Theories for Numerical Computation, November 8-12, Sichuan University, Chengdu, China. Title: *Error Estimates for Dirichlet Boundary Controls of Parabolic Equations*

2018: Invited talk, Workshop on Computational Mathematics for Youth, November 30-December 2, Zhengzhou University, Zhengzhou, China. Title: *A Robust Block Diagonal Precondtioner for Elliptic Optimal Control Problems with MFEM*

2018: Invited talk, International Workshop on PDE-constrained Optimization, Optimal Control and Applications, Tsinghua Sanya International Mathematics Forum, 10-14 December, China. Title: *Approximations of Tangential Boundary Control of Stokes Equations*

2018: Invited talk, Numerical Analysis for Non-Smooth PDE-Constrained Optimal Control Problems, Mini-workshop at Oberwolfach, 16-22 December, Germany. Title: *Dirichlet Boundary control of Stokes Equations in Polygonal Domain*

2019: Invited talk, Recent Advances of Numerical Methods for Nonlinear problems, 31 May-3 June, Hangzhou Normal University, Hangzhou, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations*

2019: Invited talk, The 8th International Congress of Chinese Mathematicians, 9-14 June, Tsinghua University, Beijing, China. Title: *Analysis and Approximations of Dirichlet Boundary control for PDEs*

2019: Minisymposium talk, SIAM Conference on Control and Its Applications, 19-21 June, Chengdu, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations in Energy Space*

2019: Invited talk, 2019 Conference on Mathematical, Physical and Intelligent Sciences, 26-30 June, Dalian University of Technology, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations in Energy Space*

2019: Minisymposium talk, International Congress on Industrial and Applied Mathematics, 15-19 July, University of Valencia, Valencia, Spain. Title: *An HDG Method for Tangential Boundary Control of Stokes Equations*

2019: Minisymposium talk, International Congress on Industrial and Applied Mathematics, 15-19 July, University of Valencia, Valencia, Spain. Title: *Optimal Control in a Bounded Domain for Wave Propagating in the Whole Space: Coupled Through Boundary Integral Equations*

2019: Minisymposium talk, The 12th Conference on Computational Mathematics of China, 31 July-4 August, Harbin Institute of Technology, Harbin, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations in Energy Space*

2019: Invited talk, Workshop on PDE-constrained Optimization, 30 August-2 September, East China Normal University, Shanghai, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations in Energy Space*

2019: Invited talk, Workshop on Numerical Methods for PDEs, 6 September-7 September, Peking University, Beijing, China. Title: *Approximations of Stokes Dirichlet Boundary control problem in Energy Space*

2019: Invited talk, 2019 Central Asia Joint Meeting in Mathematics, 15 September-19 September, Sichuan University, Chengdu, China. Title: *Approximations of Stokes Dirichlet Boundary control problem in Energy Space*

2019: Invited talk, 2019 Workshop on Computational Mathematics, 18 October-20 October, Yantai University, Yantai, China. Title: *Convergence Analysis of the Schwarz Alternating Method for Elliptic Optimal*

Control Problems

2019: Invited talk, The Ninth China-Australia Workshop on Optimization: Theory, Methods and Applications (CAWO 2019), 15 November-18 November, Shanghai University, Shanghai, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations in Energy Space*

2019: Invited talk, Forum on Computational Mathematics for Youth, 22 November-24 November, Shandong Agriculture University, Shandong, China. Title: *Analysis and Approximations of Dirichlet Boundary control of Stokes Equations in Energy Space*

2019: Invited talk, Workshop on Inverse Problems and Imaging, 6 December-8 December, Nanjing University of Aeronautics and Astronautics, Nanjing, China. Title: *Optimal Control in a Bounded Domain for Wave Propagating in the Whole Space: Coupled Through Boundary Integral Equations*

2019: Invited talk, Annual Meeting of Computational Mathematics of Henan Province, 13 December-15 December, Zhengzhou University, Zhengzhou, China. Title: *Optimal Control in a Bounded Domain for Wave Propagating in the Whole Space: Coupled Through Boundary Integral Equations*

2020: Invited talk, Workshop on Multiphysics: Mathematical Theory and Numerical Methods, 21-23 August, 2020, Xi'an Jiaotong University, Xi'an, China. Title: *On discrete shape gradient of boundary type for PDE-constrained shape optimization*

2020: Invited talk, Workshop on Theory and Application of Finite Element Method, 12-13 December, 2020, Shanghai Jiao Tong University, Shanghai, China. Title: *On discrete shape gradient of boundary type for PDE-constrained shape optimization*

2021: Invited talk, Symposium on "Scientific Computing: Theory and Applications", 24-28 June, 2021, Sichuan University, Chengdu, China. Title: *Finite element approximation to Dirichlet boundary control of Stokes equations in the L^2 space*

2021: Minisymposium talk, 2021 Annual Meeting on Computational Mathematics of Beijing-Tianjin-Hebei, 24-26 September, 2021, Zhangjiakou, China. Title: *Finite element approximation to Dirichlet boundary control of Stokes equations in the L^2 space*

2021: Minisymposium talk, 2021 Annual Meeting of CSIAM, 7-10 October, 2021, Hefei, China. Title: *Optimal convergence of finite element approximations to an optimization problem with PDE constraint*

2021: Invited talk, Workshop on Computational Mathematics, 6-7 November, 2021, Beijing Institute of Technology, Beijing, China. Title: *On discrete shape gradient of boundary type for PDE-constrained shape optimization*

2022: Invited talk, Workshop on Efficient Numerical Methods for Multi-phase Flow and its Applications, 9-10 April, 2022, Xiangtan University, Xiangtan, China. Title: *On discrete shape gradient of boundary type for PDE-constrained shape optimization*

2022: Invited talk, The 1st East and Southeast Asia Workshop on Inverse Problems and Optimal Control (ESEAW: IPOC), 1-5 August, 2022, organized by University of Duisburg-Essen, Germany, online meeting. Title: *Optimal convergence of finite element approximations to an optimization problem with PDE constraint*

Other Presentations

2007: The 8th Annual Meeting of Chinese Computational Mathematics. June, 2007, Sichuan University, Chengdu, China.

2008: Proceedings of the 27th Chinese Control Conference. July 16-18, 2008, Kunming, China.

2011: The 9th Annual Meeting of Chinese Computational Mathematics. September 18-22, 2011, Zhengzhou University, Zhengzhou, China. Title: *Error Estimates for Finite Element Approximations of Parabolic Equations with Measure Data*

2012: Workshop on Numerical Methods for Optimal Control and Inverse Problems, March 12-14, 2012,

Technische Universität München, Munich, Germany. Title: *Finite Element Approximation to Parabolic Equation with Measure Data and Its Application to Optimal Control*

2012: The 8th Finite Element Conference of China, September 23-27, 2012, Nankai University, Tianjin, China. Title: *Finite Element Approximation to Parabolic Boundary Control Problems of Dirichlet Type*

2013: Workshop on Optimal Control and Inverse Problems, July 14-17, 2013, Beijing, China. Title: *Approximations of Elliptic Optimal Control Problems with Controls from a Lower Dimensional Manifold*

2013: Workshop on Mathematical Control Theory and its Application for Youth, July 29-31, South China Normal University, Guangzhou, China. Title: *Approximations of Elliptic Optimal Control Problems with Controls from a Lower Dimensional Manifold*

2014: Workshop on Numerical Methods for Optimal Control and Inverse Problems, March 3-5, 2014, Technische Universität München, Munich, Germany. Title: *Approximations of Elliptic Optimal Control Problems with Controls from a Lower Dimensional Manifold*

2015: The 8th International Congress on Industrial and Applied Mathematics, August 10-14, 2015, Beijing, China. Title: *Parareal in Time Algorithm for The Optimal Control of Evolution Equations*

2015: Workshop on Optimal Control and Inverse Problems, July 22-25, 2015, Beijing, China. Title: *Adaptive Finite Element Method for Elliptic Optimal Control Problems: Convergence and Optimality*

2016: The Mathematics of Finite Elements and Applications, June 14-17, Brunel University London, Brunel, UK. Title: *A Multilevel Correction Method for Optimal Controls of Elliptic Equation*

2016: The Ninth Conference on Finite Element Method, August 19-23, South-west Jiaotong University, Sichuan, China. Title: *A Multilevel Correction Method for Optimal Controls of Elliptic Equation*

2016: IMACS 2016 World Congress, December 10-14, Xiamen University, Xiamen, China. Title: *Convergence of L^2-norm Based AFEM for Elliptic Optimal Control Problems*

2017: International Workshop on Recent Advances in Variational/Hemivariational Inequalities and Applications, June 24-26, Xi'an Jiaotong University, Xi'an, China. Title: *Multilevel Method for Control Constrained Elliptic Optimal Control Problems*

2017: The 11th Annual Meeting of Chinese Computational Mathematics. July 21-23, Northwestern Polytechnical University, Xi'an, China. Title: *A Convergent Adaptive Finite Element Method for Elliptic Dirichlet Boundary Control Problem*

2017: Workshop on Optimal Control and Inverse Problems, July 29-31, Linyi University, Shandong, China. Title: *Approximation of Elliptic Dirichlet Boundary Control Problem in Energy Space*

Professional Activities

Reviewer for

zbMATH

Mathematical Reviews

Reviewer for

Acta Mathematica Scientia(1X),

Acta Mathematicae Applicatae Sinica(1X),

Advance in Applied Mathematics and Mechanics(7X),

Advance in Computational Mathematics(4X),

Advances in Continuous and Discrete Models: Theory and Applications(1X),

Annals of Applied Mathematics(1X),

Applicable Analysis(1X),

Applications of Mathematics(1X),
Applied Mathematics and Computation(2X),
Applied Mathematics and Optimization(2X),
Applied Mathematics Letters(2X),
Applied Numerical Mathematics(4X),
Asia-Pacific Journal of Chemical Engineering(1X),
Automatica(1X),
Communications in Computational Physics(1X),
Communications in Mathematical Sciences(1X),
Computational and Applied Mathematics (2X),
Computational Methods in Applied Mathematics(2X),
Computer Methods in Biomechanics and Biomedical Engineering(1X),
Computational Optimization and Applications(3X),
Computers and Mathematics with Applications(3X),
Discrete and Continuous Dynamical Systems Series B.(1X),
Electronic Transactions on Numerical Analysis(1X),
ESAIM: Control, Optimisation and Calculus of Variations(3X),
ESAIM: Mathematical Modelling and Numerical Analysis(2X),
European Journal of Applied Mathematics(1X),
IMA Journal on Numerical Analysis(4X),
International Journal of Computer Mathematics(1X),
International Journal of Control(1X),
International Journal of Numerical Analysis and Modeling(1X),
Journal of Applied Mathematics and Computing(1X),
Journal of Computational and Applied Mathematics(4X),
Journal of Computational Dynamics(1X),
Journal of Computational Mathematics(8X),
Journal of Inverse and Ill-posed Problems(1X),
Journal of Mathematical Analysis and Application(1X),
Journal of Optimization Theory and Applications(2X),
Journal of Scientific Computing(5X),
Journal of Systems Science and Complexity(2X),
Mathematical Control and Related Fields(4X),
Mathematical Methods in the Applied Sciences(3X),
Mathematical Modelling and Analysis(2X),
Mathematica Numerica Sinica(2X),
Mathematics of Computation(1X),
Numerical Algebra, Control and Optimization(1X),

Numerical Functional Analysis and Optimization(5X),

Numerical Mathematics: Theory, Method and Application(7X),

Numerical Methods for Partial Differential Equations(1X),

Numerische Mathematik(3X),

Optimal Control, Application and Methods(1X),

Optimization(2X),

Optimization and Engineering(1X),

Results in Applied Mathematics(2X),

SIAM Journal on Control and Optimization(5X),

SIAM Journal on Numerical Analysis(5X),

Systems & Control Letters(1X),

Workshop Organization:

2018: International Workshop on PDE-constrained Optimization, Optimal Control, and Applications, December 10-14, 2018, Tsinghua Sanya International Mathematics Forum, Hainan, China. Co-organized with Michael Hintermüller (WIAS), Karl Kunisch (U. Graz), Ningning Yan (CAS) and Jun Zou (CUHK).

2017: Workshop on Optimal Control and Inverse Problems, July 28-30, 2017, Linyi University, Linyi, Shandong, China. Co-organized with Prof. Ningning Yan (AMSS) and Jianwei Zhou (Linyi Uni).

2016: Workshop on Optimal Control and Inverse Problems, August 5-7, 2016, Wuhan University, Wuhan, China. Co-organized with Prof. Ningning Yan (AMSS) and Xiliang Lu (Wuhan Uni).

2015: Workshop on Optimal Control and Inverse Problems, July 22-25, 2015, Beijing, China. Co-organized with Prof. Ningning Yan (AMSS) and Xiliang Lu (Wuhan Uni).

2014: Workshop on Optimal Control and Inverse Problems, July 23-25, 2014, Beijing, China. Co-organized with Prof. Ningning Yan (AMSS).

2013: Workshop on Optimal Control and Inverse Problems, July 14-17, 2013, Beijing, China. Co-organized with Prof. Ningning Yan (AMSS).

Mini-Symposium Organization:

2021: Annual Meeting of CSIAM, Hefei, China, Oct. 8-Oc. 11. MS: Numerical Methods for PDE-constrained Optimization. Co-organized with Yanping Chen (South China Normal University), Wenjing Yan (Xi'an Jiaotong University), Zhiyue Zhang (Nanjing Normal University), Zhaojie Zhou (Shandong Normal University), and Shengfeng Zhu (East China Normal University)

2021: The 13th Conference on Computational Mathematics of China, Nanjing, China, August 15-August 19. MS: Numerical Methods for PDE-constrained Optimization. Co-organized with Yanping Chen (South China Normal University), Wenjing Yan (Xi'an Jiaotong University), Zhiyue Zhang (Nanjing Normal University), Zhaojie Zhou (Shandong Normal University), and Shengfeng Zhu (East China Normal University)

2020: Annual Meeting of CSIAM, Changsha, China, Oct. 29-Nov. 1. MS: Numerical Methods for PDE-constrained Optimization. Co-organized with Yanping Chen (South China Normal University)

2020: SIAM Conference on Optimization (OP20), The Hong Kong Polytechnic University, 26-29 May, 2020. MS: Theory and Numerics for PDE-constrained Optimization. Co-organized with Buyang Li (The Hong Kong Polytechnic University) *Cancelled due to COVID-19*

2019: The 12th Conference on Computational Mathematics of China, Harbin, China, July 31-August 4. MS: Numerical Methods for PDE-constrained Optimization. Co-organized with Yanping Chen (South China Normal University) and Xiliang Lv (Wuhan University)

2019: ICIAM 2019, Valencia, Spain, July 14-18. MS: Control, Optimization and Computational Methods for Infinite Dimensional Systems. Co-organized with Weiwei Hu (Oklahoma State University)

2018: IFIP TC 7 Conference on System Modelling and Optimization, Essen, Germany, July 23-27. MS: Numerical analysis for optimal control of PDEs. Co-organized with Bangti Jin (UCL) and Buyang Li (HongKong Polytechnical University)

2016: IMACS 2016 World Congress, December 10-14, Xiamen University, Xiamen, China. MS: Recent advances in numerical methods for optimization problems with PDE constraints.

2016: The Mathematics of Finite Elements and Applications, June 14-17, Brunel University London, Brunel, UK. MS: Efficient computing with finite element methods. Co-organized with Hehu Xie (AMSS) and Shuo Zhang (AMSS)

2015: The 8th International Congress on Industrial and Applied Mathematics, August 10-14, Beijing, China. MS: Numerical approaches in optimization with PDE constraints: recent progress and future challenges. Co-organized with Prof. M. Hinze (Uni. Hamburg, Germany) and Ningning Yan (AMSS).

Advising

Master or Ph.D Students:

Zhenmin Zhang (Nanjing University, 2022-2027, expected).

Ziyi Zhang (Peking University, 2021-2026, expected).

Le Liu (Nanjing Normal University, 2020-2023, expected).

Xuelin Tao (Hebei University of Technology, 2019-2024, expected).

Kaiye Zhou (Fuzhou University, 2018-2023, expected).

Master or Ph.D. Students, Co-advised with prof. Ningning Yan:

Chang Jin (Zhejiang University, 2015-2018, China Merchants Bank).

Yue Shen (Inner Mongolia University, 2014-2019, Assistant Professor, Xi'an University of Architecture and Technology).

Zhiyu Tan (Xiamen University, 2012-2017. Postdoc, HongKong Baptist University, 2017-2019; Postdoc, Louisiana State University, 2019-2022).

Ming Yan (Huazhong University of Science and Technology, 2009-2014, Assistant Professor, Tianjin University of Economics and Finance).

Lili Chang (Henan University, 2008-2013, Associate Professor, Shanxi University).

Teaching

Autumn 2020: postgraduate, Numerics for PDE-constrained Optimization

Summer 2020: summer school of Tianyuan Mathematical Center in Northeast China, PDE-constrained Optimization

September 2018 - July 2019: undergraduate, teaching assistant for Calculus

Spring 2018: postgraduate, Numerics for PDE-constrained Optimization

September 2016 - July 2017: undergraduate, teaching assistant for Calculus

Miscellaneous

Programming Languages: Matlab, LaTeX, C, C++.

Last updated: September 19, 2022