Weifeng Qiu

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EDUCATION

Ph.D. in Computational and Applied Mathematics, the University of Texas at Austin
2006 - 2010

⋄ Advisor: Leszek Demkowicz, Serge Prudhomme

M.S. in Mathematics, University of Alabama in Huntsville   2005 - 2006
B.S. in Mathematics, Shanghai Normal University   1996 - 2000

EMPLOYMENT

Professor   July 2024 - present
Department of Mathematics, City University of Hong Kong
Associate Head   June 2023 - present
Department of Mathematics, City University of Hong Kong
Associate Professor   July 2018 - June 2024
Department of Mathematics, City University of Hong Kong
Assistant Professor   August 2012 - June 2018
Department of Mathematics, City University of Hong Kong
IMA Postdoctoral associate   2010 - 2012
Institute for Mathematics and its applications, University of Minnesota, Minneapolis
⋄ Mentor: Bernardo Cockburn

EDITORIAL SERVICE

I am an Associate Editor in editorial boards of the following journals:

(1) Computers & Mathematics with Applications

(2) Communications on Analysis and Computation

RESEARCH INTEREST

Numerical analysis, discontinuous Galerkin methods, time-harmonic problems with high wave number, fully nonlinear PDEs

GRANTS

⋄ RGC GRF-11300621 "Hybridizable Discontinuous Galerkin Approximation for the Biharmonic Operator and Some Applications", PI, 2022-2024
⋄ RGC GRF-11302219 "Hybridizable Discontinuous Galerkin Approximation for Second Order Elliptic Operator in Non-divergence Form and Some Applications", PI, 2020-2022

◇ RGC GRF-11304017 "Hybridizable discontinuous Galerkin approximation of the Maxwell operator and some applications", PI, 2018-2020
◇ RGC GRF-11302014 "New HDG methods for fluid dynamics and continuum mechanics", PI, 2015-2018
◇ RGC ECS-109713 "Discontinuous Petrov-Galerkin Methods for Partial Differential Equations with Singular Perturbation", PI, 2014-2016
◇ CityU SRG-7200324 "Discontinuous Petrov-Galerkin Methods for Partial Differential Equations", PI, 2013-2015

PUBLICATIONS

Peer Refereed Journals (published/accepted):

1. H. CHEN, H. LENG AND W. QIU (2025). Maximum-norm estimates of an IP-HDG method for parabolic problems on general polyhedral meshes. *IMA Journal of Numerical Analysis*, accepted.

2. B. LI, S. MA AND W. QIU (2025). Optimal convergence of the arbitrary Lagrangian–Eulerian interface tracking method for two-phase Navier–Stokes flow without surface tension. *IMA Journal of Numerical Analysis*, accepted.

3. S. MA, W. QIU AND X. YANG (2024). Error Analysis with Polynomial Dependence on ϵ^{-1} in SAV Methods for the Cahn-Hilliard Equation. *Journal of Scientific Computing*, 101(83).

4. W. QIU AND L. ZHAO (2024). $H(div)$-conforming HDG methods for the stress-velocity formulation of the Stokes equations and the Navier–Stokes equations. *Numerische Mathematik*, 156, 1639 - 1678.

5. X. ZHONG AND W. QIU (2024). Analysis of a Narrow-Stencil Finite Difference Method for Approximating Viscosity Solutions of Fully Nonlinear Second Order Parabolic PDEs. *Journal of Scientific Computing*, 99(3), 76.

6. B. LI, W. QIU, Y. XIE AND W. YU (2024). Weak discrete maximum principle of isoparametric finite element methods in curvilinear polyhedra. *Mathematics of Computation*, 93(345), 1 - 34.

7. X. ZHONG AND W. QIU (2023). Spectral analysis of a mixed method for linear elasticity. *SIAM Journal on Numerical Analysis*, 61(4), 1885 - 1917.

8. W. QIU (2023). An enriched Ciarlet-Raviart scheme for the biharmonic equation. *Communications on Analysis and Computation*, 1(1), 1 - 11.

9. H. GAO AND W. QIU (2023). A new error analysis and post-processing technique of the lowest-order Raviart–Thomas mixed finite element method for parabolic problems. *Computers and Mathematics with Applications*, 133, 174-188.

10. Y. HUANG, W. QIU AND W. SUN (2023). New analysis of Mixed finite element methods for incompressible Magnetohydrodynamics. *Journal of Scientific Computing*, 95(3), 72.

11. H. Gao, W. Qiu and W. Sun (2023). New analysis of Mixed FEMs for Dynamical Incompressible Magnetohydrodynamics. *Numerische Mathematik*, 153(2), 327 - 358.

12. W. Qiu and L. Tang (2023). Global $W^{2,p}$ estimates for elliptic equations in the non-divergence form. *Proceeding of American Mathematical Society*, 151, 763-770.

13. H. Chen, W. Qiu and J. Li (2022). A C^0 interior penalty method for mth-Laplace equation. *ESAIM: Mathematical Modelling and Numerical Analysis*, 56(6), 2081 - 2103.

14. H. Chen, W. Qiu and A. Pani (2022). A mixed finite element scheme for biharmonic equation with variable coefficient and von Kármán equations. *Communications in Computational Physics*, 31(5), 1434-1466.

15. B. Li, W. Qiu, Z. Yang (2022). A Convergent Post-processed Discontinuous Galerkin Method for Incompressible Flow with Variable Density. *Journal of Scientific Computing*, 91(1), 2.

16. G. Chen, W. Qiu and L. Xu (2021). Analysis of an interior penalty DG method for the quad-curl problem. *IMA Journal of Numerical Analysis*, 41(4), 2990-3023.

17. H. Gao and W. Qiu (2021). The Pointwise Stabilities of Piecewise Linear Finite Element Method on Non-obtuse Tetrahedral Meshes of Nonconvex Polyhedra. *Journal of Scientific Computing*, 87, 1 - 5.

18. H. Chen, J. Li, W. Qiu and C. Wang (2021). A Mixed Finite Element Scheme for Quad-Curl Source and Eigenvalue Problems. *Communications in Computational Physics*, 29(4), 1125-1151.

19. W. Qiu and S. Zhang (2020). Adaptive First-Order System Least-Squares Finite Element Methods for Second Order Elliptic Equations in Non-Divergence Form. *SIAM Journal on Numerical Analysis*, 58(6), 3286-3308.

20. W. Qiu and K. Shi (2020). Analysis of a semi-implicit structure-preserving finite element method for the nonstationary incompressible Magnetohydrodynamics equations. *Computers and Mathematics with Applications*, 80(10), 2150-2161.

21. W. Qiu and L. Tang (2020). A note on the Monge-Ampère type equations with general source terms. *Mathematics of Computation*, 89(326), 2675-2706.

22. W. Qiu and L. Tang (2020). On a class of generalized Monge-Ampère type equations. *Communications in Contemporary Mathematics*, 22(5).

23. W. Qiu and K. Shi (2020). A Mixed DG method and an HDG method for incompressible magnetohydrodynamics. *IMA Journal of Numerical Analysis*, 40(2), 1356-1389.

24. K. Hu, W. Qiu, K. Shi (2020). Convergence of a B-E based finite element method for MHD models on Lipschitz domains. *Journal of Computational and Applied Mathematics*, 368, 145-162.

25. W. Qiu and K. Shi (2019). Analysis on an HDG method for the p-Laplacian equations. *Journal of Scientific Computing*, 80, 1019-1032.

26. H. Gao and W. Qiu (2019). A semi-implicit energy conserving finite element method for the dynamical incompressible magnetohydrodynamics equations. *Computer Methods in Applied Mechanics and Engineering*, 346, 982-1001.

27. G Fu, Y. Jin and W. Qiu (2019). Parameter-free superconvergent $H(div)$-conforming HDG methods for the Brinkman equations. *IMA Journal of Numerical Analysis*, 39(6), 957-982.

28. B. Cockburn, G. Fu and W. Qiu (2018). Discrete H^1-inequalities for spaces admitting M-decompositions. *SIAM Journal on Numerical Analysis*, 56(6), 3407-3429.

29. H. Gao and W. Qiu (2018). Error analysis of mixed finite element methods for nonlinear parabolic equations. *Journal of Scientific Computing*, 77, 1660-1678.

30. H. Chen, W. Qiu and K. Shi (2018). A priori and computable a posteriori error estimates for an HDG method for the coercive Maxwell equations. *Computer Methods in Applied Mechanics and Engineering*, 333, 287-310.

31. W. Qiu, J. Shen and K. Shi (2018). An HDG method for linear elasticity with strong symmetric stresses. *Mathematics of Computation*, 87(309), 69-93.

32. B. Cockburn, G. Fu and W. Qiu (2017). A note on the devising of superconvergent HDG methods for Stokes flow by M-decompositions. *IMA Journal of Numerical Analysis*, 37(2), 730-749.

33. A. Cesmelioglu, B. Cockburn and W. Qiu (2017). Analysis of a Hybridizable Discontinuous Galerkin method for the steady-state incompressible Navier-Stokes equations. *Mathematics of Computation*, 86(306), 1643-1670.

34. P. Lu, H. Chen and W. Qiu (2017). An absolutely stable hp-HDG method for the time-harmonic Maxwell equations with high wave number. *Mathematics of Computation*, 86(306), 1553-1577.

35. E.T. Chung and W. Qiu (2017). Analysis of a SDG method for the incompressible Navier-Stokes equations. *SIAM Journal on Numerical Analysis*, 55(2), 543-569.

36. H. Chen, W. Qiu, K. Shi and M. Solano (2017). A Superconvergent HDG method for the Maxwell equations. *Journal of Scientific Computing*, 70(3), 1010-1029.

37. H. Chen and W. Qiu (2017). A first order system least squares method for the Helmholtz equation. *Journal of Computational and Applied Mathematics*, 309, 145-162.

38. W. Qiu, M. Solano and P. Vega (2016). A high order HDG method for curved-interface problems via approximations from straight Triangulations. *Journal of Scientific Computing*, 69(3), 1384-1407.

39. W. Qiu and K. Shi (2016). A superconvergent HDG method for the incompressible Navier–Stokes equations on general polyhedral meshes. *IMA Journal of Numerical Analysis*, 36(4), 1943-1967.

40. W. Qiu, M. Wang and J. Zhang (2016). Direct computation of stresses in linear elasticity. *Journal of Computational and Applied Mathematics*, 292, 363-368.

41. W. Qiu and K. Shi (2016). An HDG method for convection diffusion equation. *Journal of Scientific Computing*, 66(1), 346-357.

42. H. Chen, J. Li and W. Qiu (2016). Robust a posteriori error estimates for HDG method for convection–diffusion equations. *IMA Journal of Numerical Analysis*, 36(1), 437-462.

43. Z. Wang, W. Qiu, Y. Yang, C.T. Liu (2015). Atomic-size and lattice-distortion effects in newly developed high-entropy alloys with multiple principal elements. *Intermetallics*, 64, 63-69.

44. D. Arnold, G. Awanou and W. Qiu (2015). Mixed finite elements for elasticity on quadrilateral meshes. *Advances in Computational Mathematics*, 41(3), 553-572.

45. G. Fu, W. Qiu and W. Zhang (2015). An analysis of HDG methods for convection-dominated diffusion problems. *ESAIM: Mathematical Modelling and Numerical Analysis*, 49(1), 225-256.

46. H. Chen, G. Fu, J. Li and W. Qiu (2014). First order least squares method with weakly imposed boundary condition for convection dominated diffusion problems. *Computers and Mathematics with Applications*, 68(12), 1635-1652.

47. J. Chan, J.A. Evans and W. Qiu (2014). A dual Petrov–Galerkin finite element method for the convection–diffusion equation. *Computers and Mathematics with Applications*, 68(11), 1513-1529.

48. B. Cockburn, W. Qiu and M. Solano (2014). A priori error analysis for HDG methods using extensions from subdomains to achieve boundary conformity. *Mathematics of Computation*, 83(286), 665-699.

49. J. Gopalakrishnan and W. Qiu (2014). An analysis of the practical DPG method. *Mathematics of Computation*, 83(286), 537-552.

50. B. Cockburn and W. Qiu (2014). Commuting diagrams for the TNT elements on cubes. *Mathematics of Computation*, 83(286), 603-633.

51. J. Bramwell, L. Demkowicz, J. Gopalakrishnan and W. Qiu (2012). A locking-free *hp* DPG method for linear elasticity with symmetric stresses. *Numerische Mathematik*, 122(4), 671-707.

52. B. Cockburn, W. Qiu and K. Shi (2012). Superconvergent HDG methods on isoparametric elements for second-order elliptic problems. *SIAM Journal on Numerical Analysis*, 50(3), 1417-1432.

53. J. Gopalakrishnan and W. Qiu (2012). Partial expansion of a Lipschitz domain and some applications. *Frontiers of Mathematics in China*, 7(2), 249-272.

54. B. Cockburn, W. Qiu and K. Shi (2012). Conditions for superconvergence of HDG methods for second-order elliptic problems. *Mathematics of Computation*, 81(279), 1327-1353.

55. W. QIU AND L. DEMKOWICZ (2011). Mixed hp-finite element method for linear elasticity with weakly imposed symmetry: stability analysis. *SIAM Journal on Numerical Analysis*, 49(2), 619-641.

56. W. QIU AND L. DEMKOWICZ (2011). Mixed variable order h-finite element method for linear elasticity with weakly imposed symmetry. Curvilinear elements in 2D. *Computational Methods in Applied Mathematics*, 11(4), 510-539.

57. W. QIU AND L. DEMKOWICZ (2009). Mixed hp-finite element method for linear elasticity with weakly imposed symmetry. *Computer Methods in Applied Mechanics and Engineering*, 198(47), 3682-3701.

58. L. DEMKOWICZ, P. GATTO, W. QIU AND A. JOPLIN (2009). G^1-interpolation and geometry reconstruction for higher order finite elements. *Computer Methods in Applied Mechanics and Engineering*, 198(13), 1198-1212.

59. S. WU AND W. QIU (2009). Nonlinear transient dynamic analysis by explicit finite element with iterative consistent mass matrix. *Communications in numerical methods in engineering*, 25(3), 201-217.

60. P. YU, W. QIU AND D.Z. PAN (2008). Fast lithography image simulation by exploiting symmetries in lithography systems. *IEEE Transactions on Semiconductor Manufacturing*, 21(4), 638-645.

61. M. FRIEDMAN AND W. QIU (2008). On the location and continuation of Hopf bifurcations in large-scale problems. *International Journal of Bifurcation and Chaos*, 18(5), 1589-1597.