April 2025

CURRICULUM VITAE

1. Name: Pingbing Ming

Date/Place of Birth: November, 1973, Chong Qing, P.R. China

Permanent Address:
Institute of Computational Mathematics
and Scientific/Engineering Computing
Academy of Mathematics and Systems Science
Chinese Academy of Sciences
No. 55, East Road Zhong-Guan-Cun
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2. Education:

09/1997-07/2000
Institute of Computational Mathematics
and Scientific/Engineering Computing
Chinese Academy of Sciences
Ph.D Mathematics

09/1991-07/1997 Mathematics Department
Si Chuan University
MS, Mathematics

Major: Numerical analysis and scientific computing

3. Honors and Awards:

CSIAM fellow, 2024
Feng Kang Prize, 2023
National special support program
for high-level personnel recruitment:
Ten-thousand Talents Program (2019-2021)
National Natural Science Foundation of China
for Distinguished Young Scholars, 2015–2019
Zhong Jiaqing Mathematics Award, 2005
Alexander Humboldt Research Fellowship, 2000–2002

4. Work Experience:

1. Professor
   LSEC, Institute of Computational Mathematics and Scientific/Engineering Computing
   Academy of Mathematics and Systems Science
   Chinese Academy of Sciences
   April 2008–

2. Associate Professor
   LSEC, Institute of Computational Mathematics and Scientific/Engineering Computing
   Academy of Mathematics and Systems Science
   Chinese Academy of Sciences
   March 2004–March 2008

3. Assistant Professor
   Institute of Computational Mathematics and Scientific/Engineering Computing
   Academy of Mathematics and Systems Science
   Chinese Academy of Sciences
   August 2000–March 2004

4. Research Fellow
   Department of Mathematics, The Hong Kong University of Science and Technology
   Jan. 30, 2011–Feb. 28, 2012

5. Research Fellow
   Department of Mathematics, The Hong Kong University of Science and Technology
   Jan. 30, 2011–Feb. 28, 2011

6. Research Fellow
   Department of Mathematics, Penn State University September 19, 2008–October 18, 2008

7. Alexander von Humboldt Research Fellow
   Max Planck Institute for Mathematics in the Sciences, Leipzig
   March 23, 2006–May 28, 2006

8. Research Fellow
   Department of Mathematics, The Hong Kong University of Science and Technology
   February 10, 2006–March 5, 2006

9. Research Fellow
   PACM & Department of Mathematics, Princeton University
   December 6, 2004–February 4, 2005

10. Research Fellow
    Department of Mathematics, The Hong Kong University of Science and Technology
    October 1, 2004–December 1, 2004

11. Research Fellow
    PACM & Department of Mathematics, Princeton University
    February 2003–December 2003

12. Alexander von Humboldt Research Fellow
    Department of Mathematics, Ruhr-Bochum University
    November 2000–February 2002

13. Research Fellow
    Department of Mathematics, The Hong Kong University of Science and Technology
    September 1, 2000–October 15, 2000.

5. Academic Services

1. Editor in chief for *Journal on Numerical Methods and Computer Applications*, 2024.01–
2. Editor for *Science in China Mathematics*, 2023, 01–
3. Editor for *Communications in Mathematics and Statistics*, 2021. 10–
4. Founding Editor for *Fundamental Research*, 2021.01–
5. Editor for *Computational Mathematics (Chinese)*, 2021.01–2023.12
6. Editor for *Discrete and Continuous Dynamics Ser. B*, 2016.01–
7. Editor for *Journal of Computational Mathematics*, 2014.7–2020.12
8. Editor for *Advances in Mathematics (Chinese)*, 2010.1–2018.12
9. Secretary in General for Chinese Society for Computational Mathematics, 2019.8–

6. Publications in Referred Journals:

1. **Y.L. Liao and P.B. Ming, Spectral Barron space for deep neural network approximation, SIAM J. Math. Data Sci., 2025, to appear**
2. **Y.L. Liao and P.B. Ming, Heterogeneous multiscale methods for fourth-order singular perturbations, SIAM Multiscale Model Simul., 2025, to appear**
3. H.L. Li, P.B. Ming and Y.H. Zhou, The TRUNC element in any dimension and application to a modified Poisson equation, Numer. Meth. for PDEs, 41(2025), e23151.

4. **P.B. Ming and S.Q. Song, Error estimate of multiscale finite element method for periodic media revisited, Multiscale Model Simul., 22(2024), 106-124.**

5. **X. Li, X. L. Liao and P.B. Ming, A pre-training deep learning method for simulating the large bending deformation of bilayer plates, East Asian J. Appl. Math., 14(2024), 551–578.**

6. H.L. Li and P.B. Ming, An asymptotic-preserving finite element method for a forth order singular perturbation problem with boundary layers, App. Math. Lett. 149 (2024), no. 108923.

7. Y.X. Guo and P.B. Ming, A deep learning method for computing eigenvalues of the fractional Schrödinger operator, J. Syst. Sci. Complex., 37(2024), 391–412.

8. X. Li and P.B. Ming, Specht triangles approximation of large bending isometries, Ann. Appl. Math., 39(2023), 544–569.

9. **Y.L. Liao and P.B. Ming and Y. Xu, Taylor-Hood like finite elements for nearly incompressible strain gradient elasticity problems, J. Sci. Comput., 95(2023), no. 4.**

10. **Y. Meng and P.B. Ming, A new function space from Barron class and application to neural network approximation, Commun. Comput. Phys., 32(2022), 1361-1400.**

11. P.B. Ming and S.Q. Song, A Nitsche hybrid multiscale method with non-matching grids, J. Sci. Comput., 2022, Vol. 91, no. 44.

12. **Y.L. Liao and P.B. Ming, Deep Nitsche method: Deep Ritz method with essential boundary conditions, Commun. Comput. Phys., 29(2021), 1365-1384.**

13. H.L. Li, P.B. Ming and H.Y. Wang, H^2-Korn's inequality and the nonconforming elements for the strain gradient elastic model, J. Sci. Comput., 78(2021), No. 78.

14. Y.F. Huang, P.B. Ming and S.Q. Song, An efficient online-offline method for elliptic homogenization problems, CSIAM Trans. Appl. Math., 1(2020), 664–692.

15. Y. Xu, P.B. Ming and J. Chen, A phase field framework for dynamic adiabatic shear banding, J. Mech. Phys. Solids, 135(2020), 103810.

16. H.L. Li, P.B. Ming and Z.-C. Shi, The quadratic Specht triangle, J. Comput. Math., 38(2020), 103–124.

17. Y.L. Liao and P.B. Ming, A family of nonconforming rectangular elements for strain gradient elasticity, Adv. Appl. Math. Mech., 11(2019), 1263–1286.

18. R. Li, P.B. Ming, Z.Y. Sun and Z.J. Yang, An arbitrary-order Discontinuous Galerkin method with one unknown per element, J. Sci. Comput., 80(2019), 268–288.

19. **T. Luo, P.B. Ming and Y. Xiang, From atomistic model to the Peierls-Nabarro model with Gamma-surface for dislocations, Arch. Rational Mech. Anal., 230(2018), 735–781.**

20. **Y.F. Huang, J. Lu and P.B. Ming, A concurrent global-local numerical method for multiscale pdes, J. Sci. Comput., 76(2018), 1188–1215.**

21. H.L. Li and P.B. Ming, Analysis of geometrically consistent schemes with finite range interaction, Commun. Comput. Phys., 22(2017), 1333–1361.

22. **H.L. Li, P.B. Ming and Z.-C. Shi, Two robust nonconforming H2-elements for a linear strain gradient elasticity, Numer. Math., 137(2017), 691–711.**

23. P.B. Ming and X.M. Xu, A multiscale finite element method for oscillating Neumann problem on rough domain, Multiscale Model. Simul., 14(2016), 1279–1300.

24. H.L. Li and P.B. Ming, New basis function of a strain gradient finite element, Advance in Mathematics (China), 45 (2016), 955–960.

25. X. Li and P.B. Ming, A study on the quasi-continuum approximations of a one-dimensional fractural model, Multiscale Model. Simul., 12(2014), 1379-1400.

26. **J. Lu and P.B. Ming, Convergence of a force-based hybrid method with planar sharp interface, SIAM J. Numer. Anal., 52(2014), 2005-2026.**

27. X. Li and P.B. Ming, On the effect of ghost force in the quasicontinuum:method: dynamic problems in one dimension, Commun. Comput. Phys., 15(2014), 647–676.

28. J.R. Chen and Jerry Z. Yang, A constrained Cauchy-Born elasticity accelerated multigrid method for nanoindentation, Commun. Comput. Phys., 15(2014), 470–486.

29. L. Cui and P.B. Ming, The effect of ghost forces for a quasicontinuum method in three dimension, Sci. in China Ser. A: Math., 56(2013), 2571–2589.

30. **J. Lu and P.B. Ming, Convergence of a force-based hybrid method in three dimensions, Comm. Pure Appl. Math., 66(2013), 83–108.**

31. J.R. Chen and P.B. Ming, Ghost force influence of a quasicontinuum method in two dimension, J. Comput. Math., 30(2012), 657–683.

32. R. Li, P.B. Ming and F.Y. Tang, An efficient high order heterogeneous multiscale method for elliptic problems, Multiscale Model. Simul., 10(2012), 259–283.

33. J.R. Chen and P.B. Ming, An efficient multigrid method for molecular mechanics modeling in atomic solids, Commun. Comput. Phys., 10(2011), 70–89.

34. R. Du and P.B. Ming, Convergence of heterogeneous multiscale method for elliptic problem with nonsmooth coefficients, Multiscale Model. Simul., 8(2010), 1770–1783.

35. R. Du and P.B. Ming, Heterogeneous multiscale finite element method with novel numerical integration schemes, Commun. Math. Sci., 8(2010), 863–885.

36. **D. Braess, P.B. Ming and Z.-C. Shi, Shear locking in a plane elasticity problem and the enhanced assumed strain method, SIAM J. Numer. Anal., 47(2010), 4473–4491.**

37. **P.B. Ming and Jerry Z. Yang, Analysis of a one dimensional nonlocal quasicontinuum method, Multiscale Model. Simul., 7(2009), 1838–1875.**

38. P.B. Ming, Error estimate of force-based quasicontinuum method, Commun. Math. Sci., 6(2008), 1087–1095.

39. Q. Du and P.B. Ming, Cascadic multigrid methods for parabolic problems, Science in China Series A: Math., 51(2008), 1415–1439.

40. Y. Xiang, H. Wei, P.B. Ming and W. E, A generalized Peierls-Nabarro model for curved dislocations and core structures of dislocation loops in Al and Cu, Acta Materialia, 56(2008), 1447–1460.

41. H. Wei, Y. Xiang and P.B. Ming, A generalized Peierls-Nabarro model for curved dislocations using discrete Fourier transform, Commun. Comput. Phys., 4(2008), 275–293.

42. P.B. Ming, Z.-C. Shi and Y. Xu, A new superconvergence property of nonconforming rotated Q_1 element in 3D, Comput. Methods Appl. Mech. Engrg., 197(2007), 95–102.

43. **F. Liu, P.B. Ming and J. Li: Ab initio calculation of ideal strength and phonon instability of graphene in tension, Phy. Rev. B, 76(2007), 064120**

44. W. E and P.B. Ming, Cauchy-Born rule and the stability of crystalline solids: dynamic problems, Acta Math. Appl. Sin. Engl. Ser., 23(2007), 529–550.

45. **W. E and P.B. Ming, Cauchy-Born rule and the stability of crystalline solids: static problems, Arch. Ration. Mech. Anal., 183(2007), 241–297.**

46. P.B. Ming and P.W. Zhang, Analysis of the heterogeneous multiscale method for parabolic homogenization problems, Math. Comp. 76(2007), 153–177.

47. P.B. Ming and Z.-C. Shi, Analysis of some low order quadrilateral Reissner-Mindlin plate elements, Math. Comp., 75(2006), 1043–1065.

48. P.B. Ming and X.Y. Yue, Numerical methods for multiscale elliptic problems, J. Comput. Phys., 214(2006), 421–445.

49. P.B. Ming, Z.-C. Shi and Y. Xun, Superconvergence studies of quadrilateral nonconforming rotated Q_1 elements, Int. J. Numer. Anal. Model., 3(2006), 322–332.

50. P.B. Ming, Z.-C. Shi, Two nonconforming quadrilateral elements for the Reissner-Mindlin plate, Math. Models Methods Appl. Sci., 15(2005), 1503–1517.

51. **W. E, P.B. Ming and P.W. Zhang, Analysis of the heterogeneous multiscale method for elliptic homogenization problems, J. Amer. Math. Soc., 18(2005), 121–156.**

52. D. Braess and P.B. Ming, A finite element method for nearly incompressible elasticity problems, Math. Comp., 74(2005), 25–52.

53. W. E and P.B. Ming, Analysis of multiscale problem, J. Comput. Math., 22(2004), 210–219.

54. P.B. Ming and Z.-C. Shi, Mathematical analysis for quadrilateral rotated Q_1 element II: Poincaré inequality and trace inequality, J. Comput. Math., 21(2003), 277–286.

55. P.B. Ming and Z.-C. Shi, Mathematical analysis for quadrilateral rotated Q_1 element III: the effect of numerical Integration, J. Comput. Math., 21(2003), 287–294.

56. J. Hu, P. B. Ming and Z.-C. Shi, Nonconforming quadrilateral rotated Q_1 element for Reissner-Mindlin plate, J. Comput. Math., 21(2003), 25–32.

57. P.B. Ming and Z.-C. Shi, Quadrilateral mesh revisited, Comput. Methods Appl. Mech. Engrg. 191(2002), 5671–5682.

58. M. Feng, P. B. Ming and R. Yang, Absolute stable homotopy finite element method for circular arch problem and asymptotic exactness posteriori error estimate, J. Comput. Math., 20(2002), 653–672.

59. P.B. Ming and Z.-C. Shi, Optimal L^2 error estimate for the MITC3 type element, Numer. Math., 91(2002), 77–91.

60. P. B. Ming and Z.-C. Shi, Quadrilateral mesh, Chinese Ann. Math. Ser. B., 23(2002), 235–252.

61. P.B. Ming and Z.-C. Shi, Nonconforming rotated Q_1 element for Reissner-Mindlin plate, Math. Models Methods Appl. Sci., 11(2001), 1311–1342.

62. P. B. Ming and Z.-C. Shi, Error estimate of Weissman-Taylor finite element for Reissner-Mindlin plate, Science in China, Ser. A, 31(2001), 158–169.

63. P.B. Ming and Z.-C. Shi, Dual combined finite element for a Non-Newtonian flow (II): parameter-dependent problem, M2AN Math. Model Numer. Anal., 34(2000), 1051–1068.

64. P.B. Ming and Z.-C. Shi, Optimal mixed h-p finite element methods for Stokes and Non-Newtonian flow, J. Comput. Math., 19(2000), 67–76.

65. P.B. Ming and M. Feng, A stabilized finite difference methods for the equations of modeling fluidize bed and nonlinear stabilized analysis (in Chinese), Numerical Mathematica Journal of Chinese University, 19(1997), 298–311.

66. P.B. Ming and H. Xiong, Homotopy FEM for arch beam models and superconvergence analysis, Journal of Si Chuan University (Natural Science Editions), 30(1996), 484–489.

7. Publications in Lecture Notes:

1. W. E and P.B. Ming, Analysis of the local quasicontinuum method, *Frontiers and Prospects of Contemporary Applied Mathematics*, Tatsien Li and Pingwen Zhang eds., Higher Education Press, Beijing, 2005, pp. 18–32.

2. P.B. Ming and Z.-C. Shi, Some low order quadrilateral Reissner-Mindlin plate elements, *Recent advances in scientific computing and partial differential equations (Hong Kong, 2002)*. Contemp. Math., 2003, Vol. 330, Amer. Math. Soc., Providence, RI, 2003, pp. 155–168.

3. P.B. Ming and Z.-C. Shi, Convergence analysis for quadrilateral rotated Q_1 element, *Advances in Computation: Theory and Practice, Vol. 7: Scientific Computing and Applications*, Peter Minev and Yanping Lin eds., Nova Science Publishers, Inc. 2001, pp. 115–124.

4. P.B. Ming and Z.-C. Shi, Stable conforming and nonconforming finite element methods for the Non-newtonian Flow, *Numerical Treatment of Multiphase Flows in Porous Media. Lecture Notes in Physics*, Vol. 552, Zhangxin Chen, Richard E. Ewing and Z.-C. Shi eds., Springer-Verlag, 2000, pp. 222–232.

8. Selected Invited Talks:

1. Forum for *Charming women in mathematics*, Chinese Mathematics Society, Shenyang, July 26-28, 2024, plenary talk.

2. 13th Annual Meeting of Chinese Society for Computational Mathematics, Nanjing, July 15-19, 2023. plenary talk.

3. Oberwolfach Workshop on Nonstandard Finite Elements, January 11-15, 2021. invited talk.

4. The Seventh China-Germany Workshop on Computational and Applied Mathematics, August 19–23, 2019, Kiel, Germany, invited talk

5. International Workshop on Computational Mathematics, Soochow University, June 4–8, 2018, invited talk.

6. KSIAM Spring Conference, May 24-25, 2018, Korea, invited talk.

7. The International Conference on Recent Advances in Computational and Applied Mathematics, December 14–17, 2017. Wu Han university, China, invited talk.

8. 6th Chinese-Germany Workshop on Computational and Applied Mathematics, October 9–13, 2017. Tong Ji university, China, invited talk.

9. The Workshop on Multiscale Methods and Large-scale Scientific Computing, August 16–18, 2017, Hunan university, China, invited talk.

10. 9th Conference for Finite Element Method, August 19–25, E Mei, China, 2016, plenary talk.

11. The 4th ICCM–CAM Workshop on multiscale and Large scale scientific computing, June 18–20, 2016, City university of Hong Kong, invited talk.

12. **The SIAM Mathematics Aspects of Materials Science, May 7–13, 2016, Philadelphia, USA, plenary talk.**

13. IAS focus program on Mathematics and computational aspects of materials science, January 26–29, 2016, Hong Kong University of Sciences and Technology, invited talk.

14. International Workshop on Computational Mathematics, June 29–July 2, 2015, Qing Dao, China, invited talk.

15. Sino-French Conference on Computational and Applied Mathematics, Xiamen University, China, June, 2014, invited talk.

16. 8th China-Sweden-Norway Workshop on Computational Mathematics, Nanjing University, May 2012, invited talk.

17. 83rd Annual Meeting of the International Association of Applied Mathematics and MechanicsDarmstadt, Germany, March 2012, invited talk.

18. 4th Chinese-German Workshop on Computational and Applied Mathematics, Guang Zhou, September 2011, invited talk.

19. The 9th Annual Meeting for China Society for Computational Mathematics, Zheng Zhou University, September, 2011, plenary talk

20. 5th Multiscale Materials Modeling, Freiburg University, Germany, October 2010, invited talk.

21. 7th China-Sweden-Norway Workshop on Computational Mathematics, Bergen University, Sweden, June 2010, invited talk.

22. Quantum-Classical Modeling of Critical Phenomenon, CSCAMM, Maryland, USA, March 2010, invited talk.

23. Multiscale Modeling and Simulations in Sciences, Nordic Institute for Theoretical Physics, Sweden, November 2009, invited talk.

24. 5th China-Italy Conference on Mathematical Models in Life Science: Theory and Simulation, Roma, November 2009, invited talk

25. 3rd Chinese-German Workshop on Computational and Applied Mathematics, Heidelberg University, Germany, October 2010, invited talk.

26. Oberwolfach workshop on Computational Multiscale Problems, June 2009, invited talk.

27. **International Conference on Scientific Computation and Differential Equations (Sci–CADE09), May 2009, Beijing, plenary talk.**

28. Workshop on Adaptivity, Robustness and Complexity of Multiscale Algorithms, Edinburgh, April 2009, invited talk.

29. Workshop on Rheology of Complex Fluids: Modeling and Numerics, Ecole des Ponts, Paris, January 2009, invited talk.

30. 6th China-Norway-Sweden Workshop on Computational Mathematics, Fu Dan University, June 2008, invited talk.

31. Oberwolfach workshop on Atomistic Model of Materials: Mathematics Challenges, April, 2008, invited talk.

32. 4th International Congress for Chinese Mathematicians, Hang Zhou, December 2007, invited talk.

33. IAS Workshop on Mathematics of Multi-scale Problems, The Hong Kong University of Science and Technology, December 2007, invited talk.

34. 2nd Chinese-German Workshop on Computational and Applied Mathematics, Zhe Jiang University, October 2007, invited talk.

35. 5th China-Norway-Sweden Workshop on Computational Mathematics, Lund University, Sweden, June 2006, invited talk.

36. Workshop on Stochastic and Atomistic Aspects of Elasticity, Berlin, May 2006, invited talk.

37. 1st German-Chinese Workshop on Computational and Applied Mathematics, Humboldt University, Berlin, September 2005, invited talk.