Hao-Ning Wu

Affiliation

Department of Mathematics
University of Georgia
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Contact Information

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Research Interests

- ❏ Approximation theory, applied harmonic analysis, and applications to mathematical data science
- ❏ Partial differential equations (PDEs), integral equations, and their numerical analysis
- ❏ Control and optimization of systems governed by PDEs and integral equations

Education

- ❏ Ph.D. in Mathematics, The University of Hong Kong (Advisor: Xiaoming Yuan): Nov 2023
- ❏ B.Sc. in Mathematics, Jinan University, Guangzhou, China: Jun 2019

Employment

- ❏ Postdoctoral Research and Teaching Associate: Aug 2024 –
  Department of Mathematics, University of Georgia, Athens, GA, USA (Mentor: Weiwei Hu)

- ❏ Postdoctoral Fellow: Sept 2023 – Jul 2024
  Department of Mathematics, The University of Hong Kong (Mentor: Dong Li)

Academic Visits

- ❏ The University of Hong Kong (Host: Xiaoming Yuan): May 26 – Jul 25, 2025
- ❏ The University of Sydney, Australia (Host: Ding-Xuan Zhou): Jan 9 – 27, 2023

Honors and Awards

2019	Doris Chen Postgraduate Scholarship: Department of Mathematics, HKU
2019	Bachelor's Thesis Award: Jinan Undergraduate School
2018	National Scholarship: Ministry of Education of the People's Republic of China
2017	Elite Undergraduate Training Program (2017–19): Jinan Undergraduate School

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✎ Research and Related Activities

Publications

The authorship order of my coauthored works is always alphabetical
Database profiles: MathSciNet, zbMATH, Google Scholar, and ResearchGate

Journal Articles

13. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An
    Journal of Approximation Theory, 299 (2024), 106013, 23pp

12. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An
    Journal of Complexity, 80 (2024), 101789, 23PP

11. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan
    Inverse Problems, 39 (2023), 075005, 37PP

10. On the quadrature exactness in hyperinterpolation, with C. An
    BIT Numerical Mathematics, 62 (2022), 1899–1919

9. The springback penalty for robust signal recovery, with C. An and X. Yuan
    Applied and Computation Harmonic Analysis, 61 (2022), 319–346

8. Lasso hyperinterpolation over general regions, with C. An
    SIAM Journal on Scientific Computing, 43 (2021), A3967–A3991

7. Tikhonov regularization for polynomial approximation problems in Gauss quadrature points, with C. An
    Inverse Problems, 37 (2021), 015008, 19PP

Not Yet Appeared

6. Cellular flow control design for mixing based on the least action principle, with W. Hu and M.-J. Lai
    Submitted. arXiv: 2510.22703

5. The path of hyperinterpolation: A survey, with C. An and J. Ran
    Submitted. arXiv: 2510.04904

4. Optimal time scheduling for a simple reparable system, with D. O. Adu, A. J. Brower, and W. Hu
    Conference submission.

3. Marcinkiewicz–Zygmund inequalities for scattered data on polygons
    Submitted. arXiv: 2411.16584

2. Spherical configurations and quadrature methods for integral equations of the second kind, with C. An
    SIAM Journal on Numerical Analysis, to appear.

1. Breaking quadrature exactness: A spectral method for the Allen–Cahn equation on spheres, with X. Yuan
    Submitted. arXiv: 2305.04820

Degree Theses

- Restricted isometry and information-based numerical analysis, *Ph.D. Dissertation* (2023)
- Regularized least squares approximation using orthogonal polynomials, *B.Sc. Thesis* (2019)

Presentations

7 conference talks in 7 cities | **4** seminar talks at 2 institutions

Conferences and Workshops

- Invited talk, Special Session on "Recent Developments in Harmonic Analysis and Frame Theory," AMS Spring Eastern Sectional Meeting, Boston College, MA, USA, Mar 28 – 29, 2026

- Invited talk, Minisymposium on "Estimation and Control of PDE Systems," SIAM Conference on Control and Its Applications (CT25), Montreal, Canada, Jul 28 – 30, 2025

- Contributed talk, Shanks Conference on Constructive Functions Celebrating Ed Saff's 80th birthday, Vanderbilt University, Nashville, TN, USA, May 19 – 22, 2025

- Contributed talk, Southeast Applied and Computational Math Student Workshop, Auburn University, AL, USA, Apr 4 – 5, 2025

- Poster presentation, Georgia Scientific Computing Symposium, Georgia Institute of Technology, Atlanta, GA, USA, Feb 8, 2025

- Contributed talk, International Conference on Analysis and Applications in honor of Roderick S. C. Wong's 80th birthday, City University of Hong Kong, Jun 3 – 6, 2024

- Contributed talk, The 7th Workshop on Recent Advances on Spectral Methods and Related Applications, Beijing Computational Science Research Center, China, Jun 8 – 9, 2019

Seminars and Colloquiums

- Applied Math Seminar, University of Georgia, Athens, GA, USA, Oct 14, 2025
- Applied Math Seminar, University of Georgia, Athens, GA, USA, Oct 15, 2024
- Postgraduate Student Seminar, The University of Hong Kong, Jun 26, 2023
- Qualifying Research Seminar, The University of Hong Kong, Jan 21, 2021

Grants and Travel Support

Internal Funding Schemes

- National Undergraduate Innovation Training Program (no. 201710559017) - *Research on barycentric interpolation: algorithm and application*
  Jinan Undergraduate School: 20,000 CNY, Aug 1, 2017 – Jul 31, 2018

Travel Support

- Travel Support for RPg Students for Intl. Academic Research Activities 2022/23 (Sept Round)
  HKU University Research Committee: 13,500 HKD, Jan 1 – 28, 2023

- Exchange Scholarship for Short-term Programs at McGill University 2016/17 (Winter Round)
  JNU Office of International Exchange and Cooperation: 20,000 CNY, Jan 30 – Feb 17, 2017

📖 Teaching and Related Activities

Instructorship of Record

University of Georgia

Fall 2025	MATH2250	Calculus I for Science and Engineering
Fall 2024	MATH1113	PreCalculus

Teaching Assistantship

Certificate: *Certificate of Teaching and Learning in Higher Education* (Nov 2019), issued by HKU Centre for the Enhancement of Teaching and Learning (CETL) after completing eight 3-hour in-person modules on teaching in a university context

Main Responsibility: Offering weekly classroom tutorials/recitations

Spring 2023	MATH1013	University Mathematics II (HKU)
Fall 2022	MATH3901	Operations Research I (HKU)
Spring 2022	MATH1013	University Mathematics II (HKU)
Fall 2021	MATH3901	Operations Research I (HKU)
Spring 2021	MATH1009	Basic Mathematics for Business and Economics (HKU)
Fall 2020	MATH2101	Linear Algebra I (HKU)
Spring 2020	MATH1009	Basic Mathematics for Business and Economics (HKU)
Fall 2018	07010167	Numerical Linear Algebra (JNU)

🌐 SERVICE AND RELATED ACTIVITIES

TIME FORMAT: MM/YY
n REPORTS DELIVERED: $\times n$

Academic Service

Referee for Journals/Conferences

- ACC – American Control Conference ($\times 2$)
- Applied Numerical Mathematics ($\times 2$)
- Advances in Computational Mathematics ($\times 5$)
- IEEE Transactions on Neural Networks and Learning Systems
- International Journal of Computer Mathematics ($\times 2$)
- Journal of Scientific Computing
- Numerical Algorithms
- Signal Processing ($\times 2$)

Miscellaneous

- Referee: S.T. Yau High School Science Award (Asia) (09/22, 09/21)
- Conference Assistant: Conference on Advances in Nonsmooth Analysis and Applications, Southern University of Science and Technology, Shenzhen, China (12/19)

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