

Hao-Ning Wu

Affiliation

Department of Mathematics
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Research Interests

- ❑ Approximation theory, applied harmonic analysis, and mathematical data science
- ❑ Numerical analysis and data-driven methods for PDEs and integral equations
- ❑ Intelligent 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

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

12. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An
Journal of Approximation Theory, 299 (2024), 106013, 23PP
11. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An
Journal of Complexity, 80 (2024), 101789, 23PP
10. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan
Inverse Problems, 39 (2023), 075005, 37PP
9. On the quadrature exactness in hyperinterpolation, with C. An
BIT Numerical Mathematics, 62 (2022), 1899–1919
8. The springback penalty for robust signal recovery, with C. An and X. Yuan
Applied and Computation Harmonic Analysis, 61 (2022), 319–346
7. Lasso hyperinterpolation over general regions, with C. An
SIAM Journal on Scientific Computing, 43 (2021), A3967–A3991
6. Tikhonov regularization for polynomial approximation problems in Gauss quadrature points, with C. An
Inverse Problems, 37 (2021), 015008, 19PP

Not Yet Appeared

5. Cellular flow control design for mixing based on the least action principle, with W. Hu and M.-J. Lai
Submitted. arXiv: 2510.22703
4. The path of hyperinterpolation: A survey, with C. An and J. Ran
Submitted. arXiv: 2510.04904
3. Optimal time scheduling for a simple separable system, with D. O. Adu, A. J. Brower, and W. Hu
Conference submission.
2. Marcinkiewicz–Zygmund inequalities for scattered data on polygons
Submitted. arXiv: 2411.16584
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

9 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, International Conference on Scientific Machine Learning 2025, The University of Hong Kong, Dec 1 – 3, 2025
- Invited talk, HKU Workshop on PDEs and Analysis, The University of Hong Kong, Nov 29, 2025
- 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

Spring 2026	MATH4740/6740	Optimization and Data Analysis (30% teaching share)
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: ×*n*

Academic Service

Referee for Journals/Conferences

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

Organization

- Co-organizer: 2026 Georgia Scientific Computing Symposium, Athens, GA, USA, Feb 21, 2026

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)

ATHENS, GA · December 12, 2025

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