

# Hao-Ning Wu

## Affiliation

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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. The path of hyperinterpolation: A survey, with C. An and J. Ran  
*Dolomites Research Notes on Approximation*, 18.1 (2025), 135–145 (*invited survey*)
11. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An  
*Journal of Approximation Theory*, 299 (2024), 106013, 23PP
10. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An  
*Journal of Complexity*, 80 (2024), 101789, 23PP
9. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan  
*Inverse Problems*, 39 (2023), 075005, 37PP
8. On the quadrature exactness in hyperinterpolation, with C. An  
*BIT Numerical Mathematics*, 62 (2022), 1899–1919
7. The springback penalty for robust signal recovery, with C. An and X. Yuan  
*Applied and Computation Harmonic Analysis*, 61 (2022), 319–346
6. Lasso hyperinterpolation over general regions, with C. An  
*SIAM Journal on Scientific Computing*, 43 (2021), A3967–A3991
5. Tikhonov regularization for polynomial approximation problems in Gauss quadrature points, with C. An  
*Inverse Problems*, 37 (2021), 015008, 19PP

### Not Yet Appeared

4. Cellular flow control design for mixing based on the least action principle, with W. Hu and M.-J. Lai  
*Submitted*. arXiv: 2510.22703
3. Optimal time scheduling for a simple repairable 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:  $\times n$

## 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 ( $\times 2$ )
- Numerical Algorithms
- Signal Processing ( $\times 2$ )

### 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 31, 2025

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