# Hao-Ning Wu

### **Affiliation**

Department of Mathematics University of Georgia Athens, GA 30602, USA Contact Information (706) 240-4943 ☎ hnwu@uga.edu ຯ

haoningwu.github.io

Research Interests			
$\square$ Approximation theory, applied harmonic analysis, and their applications to mathematical data science $\square$ Partial differential equations (PDEs), integral equations, and their numerical analysis			
☐ Mathematical control theory of PDEs and optimal control of fluid dynamics			
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 (Mentor: Weiwei Hu)			
□ Postdoctoral Fellow: Sept 2023 – Jul 2024			
Department of Mathematics, The University of Hong Kong (Mentor: Dong Li)			
Visiting			
$\hfill\Box$ The University of Sydney, Australia (Host: Ding-Xuan Zhou): Jan 9 – 27, 2023			

# **Honors and Awards**

- 2019 Doris Chen Postgraduate Scholarship: Dept of Mathematics, The University of Hong Kong
- 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 all my coauthored works is alphabetical Clickable entries to database profiles: MathSciNet, zbMATH, Google Scholar, and ResearchGate

#### Journal Articles

- 7. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An Journal of Approximation Theory, 299 (2024), 106013, 23PP
- 6. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An *Journal of Complexity*, 80 (2024), 101789, 23PP
- 5. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan *Inverse Problems*, 39 (2023), 075005, 37PP
- 4. On the quadrature exactness in hyperinterpolation, with C. An BIT Numerical Mathematics, 62 (2022), 1899–1919

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- 3. The springback penalty for robust signal recovery, with C. An and X. Yuan Applied and Computation Harmonic Analysis, 61 (2022), 319–346
- 2. Lasso hyperinterpolation over general regions, with C. An SIAM Journal on Scientific Computing, 43 (2021), A3967–A3991
- 1. Tikhonov regularization for polynomial approximation problems in Gauss quadrature points, with C. An

Inverse Problems, 37 (2021), 015008, 19PP

### Not Yet Appeared

- 2. Spherical configurations and quadrature methods for integral equations of the second kind, with C. An Submitted to a Journal. Preprint at arXiv: 2408.14392
- 1. Breaking quadrature exactness: A spectral method for the Allen–Cahn equation on spheres, with X. Yuan

Submitted to a Journal. Preprint at arXiv: 2305.04820

### **Theses**

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

#### **Presentations**

2 conference talks in 2 cities | 3 seminar talks at 2 academic institutions

### **Conferences and Workshops**

- 20-min contributed talk, Hyperinterpolation, Marcinkiewicz–Zygmund property, and their use for spectral methods, 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
- 15-min contributed talk, *The numerical study of regularized barycentric interpolation*, 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, Hyperinterpolation, Marcinkiewicz–Zygmund property, and their use for integral equations, Dept of Mathematics, University of Georgia, Athens, GA, USA, Oct 15, 2024
- Postgraduate Student Seminar, Restricted isometry and information-based numerical analysis, Dept of Mathematics, The University of Hong Kong, Jun 26, 2023
- Qualifying Research Seminar, Lasso hyperinterpolation over general regions, Dept of Mathematics, The University of Hong Kong, Jan 21, 2021

## **Grants and Travel Support**

# **Internal Funding Schemes**

- Travel Support for RPg Students for Intl. Academic Training/Research Activities 2022/23 (Sept Round), HKU University Research Committee: 13,500 HKD, Jan 1 28, 2023
- National Undergraduate Training Program for Innovation and Entrepreneurship (no. 201710559017) Research on barycentric interpolation: algorithm and application, Jinan Undergraduate School: 20,000 CNY, Aug 1, 2017 Jul 31, 2018
- 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, 2017 Feb 17, 2017

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# TEACHING AND RELATED ACTIVITIES

# Instructorship of Record

# University of Georgia

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 modules on principles of learning, teaching, assessment, and feedback in a university context.

**Responsibilities:** Offering weekly tutorials, preparing/grading assignments, and holding office hours.

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/yyn Reports Delivered:  $\times n$ 

### **Academic Service**

#### Referee for Journals

- Advances in Computational Mathematics (×4)
- IEEE Transactions on Neural Networks and Learning Systems
- International Journal of Computer Mathematics  $(\times 2)$
- Mathematics
- Numerical Algorithms

#### 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)

### Membership of Learned Societies

• SIAM – Society for Industrial and Applied Mathematics (since 07/22)

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