Hao-Ning Wu

Affiliation
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Research Interests

❑ Analysis, partial differential equations (PDEs) and integral equations, and their numerical analysis
❑ Approximation theory, applied harmonic analysis, and their applications to mathematical data science

Specific Topics include multivariate approximation, orthogonal polynomials, high-dimensional numerical integration, spectral methods for PDEs, boundary integral methods, and compressed sensing/imaging.

Education

❑ Ph.D. in Mathematics, The University of Hong Kong, China: Dec 2023 (to be conferred)
   Thesis title: Restricted isometry and information-based numerical analysis (Jul 2023)
   Advisor: Prof. X. YUAN
❑ B.Sc. in Mathematics, Jinan University, Guangzhou, China: Jun 2019

Academic Position

❑ Postdoctoral Fellow: Sept 2023 –
   Department of Mathematics, The University of Hong Kong, China (Mentor: Prof. D. LI)

Visiting

❑ The University of Sydney, Australia, hosted by Prof. D.-X. ZHOU: Jan 9 – 27, 2023

Honors and Awards

2019   Doris Chen Postgraduate Scholarship: Dept of Mathematics, The University of Hong Kong
           To attract top quality research postgraduate students to the department
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
           To offer major-related complementary research training to top students (<1% each cohort)

✍ RESEARCH AND RELATED ACTIVITIES

Research Publications

Clickable entries to database profiles: MathSciNet, zbMATH, Google Scholar, and ResearchGate.
The authorship order of all my coauthored works is alphabetical.

Journal Articles

6. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An
   J. Complexity, 80 (2024), 101789
5. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan
   Inverse Problems, 39 (2023), 075005
4. On the quadrature exactness in hyperinterpolation, with C. An
   BIT Numer. Math., 62 (2022), 1899–1919

3. The springback penalty for robust signal recovery, with C. An and X. Yuan
Appl. Comput. Harmon. Anal., 61 (2022), 319–346
2. Lasso hyperinterpolation over general regions, with C. An
SIAM J. Sci. Comput., 43 (2021), A3967–A3991
1. Tikhonov regularization for polynomial approximation problems in Gauss quadrature points, with C. An
Inverse Problems, 37 (2021), 015008

Preprints

2. Breaking quadrature exactness: A spectral method for the Allen–Cahn equation on spheres, with X. Yuan
arXiv: 2305.04820
1. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An
arXiv: 2205.08218

Presentations

Conferences and Workshops

- The 7th Workshop on Recent Advances on Spectral Methods and Related Applications, Beijing Computational Science Research Center, China, Jun 8 – 9, 2019
  The numerical study of regularized barycentric interpolation

Seminars and Colloquiums

- Postgraduate Student Seminar (thesis defense), Dept of Mathematics, The University of Hong Kong, China, Jun 26, 2023
  Restricted isometry and information-based numerical analysis
- Qualifying Research Seminar, Dept of Mathematics, The University of Hong Kong, China, Jan 21, 2021
  Lasso hyperinterpolation over general regions

Grants and Travel Support

Internal Funding Schemes

- Travel Support for Research Postgraduate Students 2022/23 (Sept Round)
  HKU University Research Committee: 13,500 HKD, Jan 1 – 28, 2023
- National Undergraduate Innovation Research Grant 201710559017 - *Research on barycentric interpolation: Algorithm and application*
  JNU Undergraduate School: 20,000 CNY, Aug 1, 2017 – Jul 31, 2018

🖥 Teaching and Related Activities

Classroom Teaching Duties

Teaching Assistant Duties

Certificate: *Certificate of Teaching and Learning in Higher Education* (Nov 2019), issued by HKU Centre for the Enhancement of Teaching and Learning (CETL) upon completion of eight 3-hour modules about the principles of learning, teaching, assessment and feedback in a university context.
Responsibilities: Offering weekly tutorials; preparing and grading assignments; holding office hours; and invigilating tests and exams.

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

Academic Service

Referee for Journals

- Advances in Computational Mathematics (05/23)
- Numerical Algorithms (08/22)

Misc

- 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

- CMS – Chinese Mathematical Society (since 08/23)
- CSCM – Chinese Society for Computational Mathematics (since 08/23)
- HKSIAM – Hong Kong Society for Industrial and Applied Mathematics (since 03/23)
- SIAM – Society for Industrial and Applied Mathematics (since 07/22)