Hao-Ning Wu

Affiliation

Department of Mathematics
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Research Interests

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

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

Education

❑ Ph.D. in Mathematics, The University of Hong Kong: Nov 2023
    Thesis title: Restricted isometry and information-based numerical analysis
    Advisor: Xiaoming 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 (Mentor: Dong Li)

Visiting

❑ The University of Sydney, Australia (D.-X. 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 my 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
    J. Approx. Theory, 299 (2024), 106013, 23pp

6. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An
    J. 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 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, 19PP

Preprints

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

Presentations

Conferences and Workshops

- 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
  Hyperinterpolation, Marcinkiewicz–Zygmund property, and their use for spectral methods
- 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, Dept of Math, The University of Hong Kong, Jun 26, 2023
  Restricted isometry and information-based numerical analysis
- Qualifying research seminar, Dept of Math, The University of Hong Kong, Jan 21, 2021
  Lasso hyperinterpolation over general regions

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 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) 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/yy

Academic Service

Referee for Journals

- Advances in Computational Mathematics ($\times$4)
- International Journal of Computer Mathematics ($\times$2)
- Numerical Algorithms

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)

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