Hao-Ning Wu

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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 constructive approximation, orthogonal polynomials, high-dimensional numerical integration, spectral methods, boundary integral methods, learning theory, and compressed sensing/imaging.

Education

❏ Ph.D. candidate (Mathematics), The University of Hong Kong: Sept 2019 – Jul 2023 (expected)
  Thesis title: Restricted isometry and information-based numerical analysis
  Advisor: Prof. X. Yuan
❏ B.Sc. (Mathematics), Jinan University, Guangzhou, China: Jun 2019

Honors and Awards

2019   Doris Chen Postgraduate Scholarship (Dept of Mathematics, HKU)
2018   National Scholarship (Ministry of Education of the People's Republic of China)
2017   Two-year Elite-Undergraduate Training Program (JNU/top 1% in cohort 2015–2019)

RESEARCH AND RELATED ACTIVITIES

Research Visits

❏ Visiting Research Student, University of Sydney, Australia, hosted by Prof. D.-X. Zhou: Jan 9 – 27, 2023

Publications and Preprints

The authorship order of all my coauthored works is alphabetical.

Journal Articles

5. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan.
   Inverse Problems, to appear.
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

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

2. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An.
   arXiv: 2209.11012
1. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An.
   arXiv: 2205.08218

Presentations

Presentation at Conferences

❑ 15-min 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

❑ 45-min qualifying research seminar, Department of Mathematics, The University of Hong Kong, Jan 21, 2021

Grants and Travel Support

Proposal-required funding schemes:

❑ HKU Travel Support for Research Postgraduate Students for International Academic Training/Research Activities, 13,500 HKD: Jan 2023
❑ National Undergraduate Innovation Research Grant 201710559017, *Research on barycentric interpolation: Algorithm and application*, 20,000 CNY: Aug 1, 2017 – Jul 31, 2018

TEACHING AND RELATED ACTIVITIES

Teaching

Teaching Assistant Duties

Certificate: *Certificate of Teaching and Learning in Higher Education* (CTLHE), issued by the Centre for the Enhancement of Teaching and Learning (CETL), The University of Hong Kong, on Nov 8, 2019
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 Service (in mm/yy)

❑ Refereed journal articles for
  Advances in Computational Mathematics (05/23)
  Numerical Algorithms (08/22)
❑ Refereed competition submissions for
  S.T. Yau High School Science Award (Asia) (09/22, 09/21)

Membership of Learned Societies

❑ Society for Industrial and Applied Mathematics (since 2022)

Last updated on May 22, 2023.