Yiran Hu

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EDUCATION

- Ph.D. in Mathematics — The University of Texas at Austin • Expected May 2024
  - Research focus: Partial differential equations of the 3D singular quasi-geostrophic system
  - GPA: [4.0/4.0]
- B.Sc. in Pure and Applied Mathematics — Nanjing University • Sep 2014 – Jul 2018
  - Distinction: Summa cum laude
  - GPA: [4.3/5.0]

PUBLICATION AND PREPRINT

- Hu Yiran. "Global in Time Weak Solutions to Singular 3D Quasi-Geostrophic Systems." arXiv preprint arXiv:2302.05973 (2023)".

EXPERIENCES

- Quantitative Research Intern — World Quant LLC • Jun 2023 – Aug 2023
  - Applied generalized reduced gradient methods to accelerate the optimization problems with a large volume of data.
  - Developed stock trading strategies by applying deep learning to time series data.
  - Presented an overview of academic literature to connect the credit market and the equity market.
- Well-posedness of Singular 3D QG System — The University of Texas at Austin • 2018 - Present
  - Generalized the 3D singular quasi-geostrophic (3D QG) system from the 2D case by proposing interpretable physics pictures that improve the description of temperature dynamics near the surface of the Earth.
  - Analyzed and proved mathematically the existence and regularity of the solutions by using the elliptic analysis, extension method, Aubin Lions Lemma, and weighted spaces.
- Numerical analysis for SQGf System — The University of Texas at Austin • 2020 - Present
  - Utilized numerical analysis and simulation methods to obtain the conjunctures for analysis on singularities of surface quasi-geostrophic front (SQGf) equations by implementing specialized RK-4 and spectrum method in Python and MATLAB with scientific packages including numpy, py-pde, matplotlib, simulink, etc.
- Teaching Assistant and Research Assistant — The University of Texas at Austin • 2018 - Present
  - Organized group seminars among graduate students, professors, and outreaches.
  - Designed and taught both undergraduate and graduate courses including calculus, linear algebra, differential equations, applied mathematics, complex analysis, and numerical analysis.
  - Mentored undergraduate students and helped them present on topics including support vector machine, stochastic calculus for finance and discrete Fourier and wavelet transforms, quantum mechanics, and numerical partial differential equations.

SKILLS

- Programming languages: Python, R, Excel, MySQL, MATLAB, C++, LaTeX, Markdown
- Languages: English (fluent), Chinese (native)