Xingjian Xu

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Areas of Expertise: Deep learning for PDE, Numerical solutions for PDE

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EDUCATION

- **Lanzhou University** — Lanzhou, China
  Masters of Science in Computational Mathematics; — *Sep 2020 - Jun 2023*
  Relevant course work: Modern Computational Methods, Functional Analysis, Machine Learning, Probability Measures, Algebra, PDE.

- **South China Normal University** — Guangzhou, China
  *Bachelor of Applied Statistics; **Major GPA: 3.61/4*** — *Sep 2016 - Jun 2020*

PUBLICATIONS

- J1: **Xingjian Xu**, Minghua Chen, Discovery of subdiffusion problem with noisy data via deep learning. *J Sci Comput* 92,23(2022). https://doi.org/10.1007/s10915-022-01879-8

- PrePrints: Wenrui Hao, Chunmei Wang, **Xingjian Xu**, Haizhao Yang, Deep Learning via Neural Energy Descent. arxiv:2302.10424(2023).

ACADEMIC PROJECTS

- **Gaussian Stein Derivative for Approximating in Deep Learning** — 2022 - present
Developed a module that uses the Monte-Carlo method to approximate the partial derivatives in ODE/PDE systems instead of autodifferenting the value of derivatives, which is a popular method in PINN. Applied this to Black-Scholes equations and fractional problems.

- **Dictionary Learning for Approximating Solutions and Others in a Subdiffusion Model** — 2022 - Present
Developed a dictionary parameter matrix to recover the solution and source term of a subdiffusion model based on the Sylvester equation, which is discretized by the BDF(k) and L(k) methods.

- **The Statistical Efficacy Estimates and Improvement of Three-Segment Spondylosis** — 2022
Developed a statistical method for comparing the therapeutic outcomes of anterior cervical sugery in three modalities for the treatment of three-segment cervical spondylosis.This project was conducted in partnership with Fujian Medical University's Union Hospital.

- **Data Analysis Project On Climate And Electricity Consumption** — 2021
Implemented a self-adapted model to examine the relationship between climate change and electricity consumption in Gansu Province, China. This project was completed in the School of Management at Lanzhou University.

- **Statistic Market Survey of Advanced Consumption Concept based on Alipay Apps** — 2019
Drafted a statistical report on Advanced Consumption Concepts, which uses public databases and R language

- **Surrogate Marker Evaluation from a Clinical Trial of Binary True and Continuous Longitudinal** — 2019
Surrogate Endpoints Designed a creative statistical test, based on surrogate models of clincial trials, which could guarantee the efficency of clincial trials by not using the true endpoints.

- **Modeling and Observation of Undergraduate Statistical Computing Ability Structure** — 2017
This educational reform project used survey data from undergraduate students to investigate their ability to understand and apply statistcial computing methods. It then used the statistical test results from the questionnaire to create a report using Python.

EXPERIENCE

- **Youshu Culture Communication Co., Ltd** — Shanghai, China
  Media Data Operations Specialist (Remote) — *Jun 2020 - Jul 2020*
  - **Data analysis:** Supervised and analysed the weekly usage of APP, which can describe client charactristics based on the SQL environment; regularly provided the data report for media operations
  - **Upgrade strategy:** Designed and developed a weekly strategy based on new data to increase the the number of users and disscussion topics for breaking news
  - **App discovery:** Worked on application profiling features and related usage simulation tests

CONFERENCE

- The 19th Annual Meeting of the Chinese Society for Industrial and Applied Mathematics (**CSIAM**),*Participant.* — Hefei, China — Oct 3 - Oct 7, 2021

- Academic Symposium for "Deep Learning and Numerical Solution of PDE," **Tianyuan Mathematical Center**,*Participant.* — Xi'an, China — Jul 17 - Jul 18, 2021

- Academic Symposium for "Theory and Application of Big Data and Artificial Intelligence," **Gansu Applied Mathematical Center**,*Participant.* — Lanzhou, China — May 22 - May 24, 2021

Honors & Awards

- National scholarship for graduate students in the Lanzhou University — Sep 2022 - Jun 2023
- Third-class scholarship for graduate students in the School of Mathematics and Statistcs — Sep 2021 - Sep 2022
- Third-class scholarship for graduate students in the School of Mathematics and Statistics — Sep 2020 - Sep 2021
- Special scholarship for undergraduate students in the Schoool of Mathematics Science — Aug 2019 - Apr 2020
- First place in Mathematics Competition, South China Normal University — Aug 2019 - Oct 2019
- Second place (H prize) in Mathematical Contest in Modeling — Jun 2019

Skills Summary

- **Programming languages**: Matlab, Python, C++, R
- **Foreign language**: Mandarin Chinese(Native),English(Fluent)