Shiping Zhou

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Department of Computational Mathematics, Science and Engineering
Michigan State University, East Lansing, Michigan, MI 48824

EDUCATION

Missouri University of Science and Technology, *Rolla, MO*
Ph.D. in Mathematics (*Computational and Applied Mathematics Emphasis*) *Aug. 2019 – May 2024*
Advisor: Prof. Yanzhi Zhang

Shandong University, *Jinan, Shandong, China*
M.S. in Computational Mathematics *Sep. 2016 – Jun. 2019*
Advisor: Prof. Fuzheng Gao

Anhui University of Technology, *Ma'anshan, Anhui, China*
B.S. in Mathematics and Applied Mathematics *Sep. 2012 – Jul. 2016*

Research Interests

- Modeling and simulation of nonlocal models, collision operators
- Reduced order modeling for PDEs, shallow water moment equations
- Data-driven modeling and simulation
- Deep neural network for solving PDEs
- FEM/FDM/FVM/DG and Spectral methods

Academic Experience

Michigan State University, *East Lansing, MI*
Postdoctoral Research Associate *Aug. 2024 – present*

Missouri University of Science and Technology, *Rolla, MO*
Graduate Teaching/Research Assistant *Aug. 2019 – May 2024*

Publications and Preprints

10. Nonlocal modeling of spatial fractional diffusion with truncated interaction domains and truncated kernel function singularity, **S. Zhou**, Y. Zhang, and M. Gunzburger, under review (2025).

9. Moment-enhanced shallow water equations for non-slip boundary conditions, **S. Zhou**, J. Huang, and A. J. Christlieb, in revision (2025).

8. Convolutional neural network-based reduced-order modeling for parametric nonlocal PDEs, Y. Wang, **S. Zhou**, and Y. Zhang, Comput. Methods Appl. Mech. Eng., 444 (2025), pp. 118084.

7. An accurate and efficient parallel finite difference scheme for fractional diffusion in heterogeneous media, **S. Zhou**, and Y. Zhang, submitted (2026).

6. Data-driven approach for the solutions of time-dependent PDEs using convolutional neural network, **S. Zhou**, Y. Li, and Y. Zhang, to be submitted (2026).

5. Parametric model reduction with convolutional neural networks, Y. Wang, **S. Zhou**, and Y. Zhang, Int. J. Numer. Anal. Mod., 21 (2024), pp. 716-738.

4. Analytical and computational aspects of the high-order fractional Laplacian, J. P. Borthagaray, Y. Wu, **S. Zhou**, and Y. Zhang, preprint (2023).

3. Fourier pseudospectral methods for the spatial variable-order fractional wave equations, X. Zhao, Y. Zhang, **S. Zhou**, Comput. Phys. Commun., 318 (2025), pp. 109876.

2. A novel and simple spectral method for nonlocal PDEs with the fractional Laplacian, **S. Zhou** and Y. Zhang, Comput. Math. Appl., 168 (2024), pp.133–147.

1. Weak Galerkin finite element method with second-order accuracy in time for parabolic problems, **S. Zhou**, F. Gao, B. Li, and Z. Sun, Appl. Math. Lett., 90 (2019), pp. 118–123.

Presentations

14. Poster: A deterministic particle method for the relativistic Landau equation, 28th International Conference on Numerical Simulation of Plasmas (ICNSP 2025), UCI, Irvine, CA, 2025/11
13. Invited talk: Moment-enhanced shallow water equations for non-slip boundary conditions, 2025 SIAM New York-New Jersey-Pennsylvania Section Conference, Penn State, State College, PA, 2025/10
12. Poster: Data-driven modeling of time-dependent nonlocal PDEs, CHaRMNET 2024 Annual Meeting, Virginia Tech, Blacksburg, VA, 2024/12
11. Invited talk: A novel and simple spectral method for nonlocal PDEs with fractional Laplacian, The 8th Annual Meeting of SIAM Central States Section, Lincoln, NE, 2023/10
10. Seminar talk: A novel and simple spectral method for nonlocal PDEs with fractional Laplacian, Graduate Seminar at Missouri University of Science and Technology, Rolla, MO, 2023/4
9. Poster: Numerical studies on the high-order fractional Laplacian, Pi Day at Missouri University of Science and Technology, Rolla, MO, 2023/3
8. Seminar talk: Accurate and efficient spectral method for fractional wave equations, Numerical Analysis Seminar at University of Pittsburgh, Pittsburgh, PA, 2023/2
7. Invited talk: Accurate and efficient spectral method for fractional wave equations, The 7th Annual Meeting of SIAM Central States Section, Stillwater, OK, 2022/10
6. Poster: Numerical studies on the high-order fractional Laplacian, Theoretical and Applied Aspects for nonlocal Models - Workshop of Banff International Research Station (BIRS), Online, 2022/7
5. Seminar talk: Numerical methods for acoustic wave equations, Graduate Seminar at Missouri University of Science and Technology, Rolla, MO, 2022/4
4. Poster: Numerical studies on the high-order fractional Laplacian, The University of Kansas Numerical Analysis Day 2022, Lawrence, KS, 2022/3
3. Seminar talk: Numerical studies on the high-order fractional Laplacian, Continuum Mechanics Seminar at University of Nebraska-Lincoln, Online, 2022/3
2. Invited talk: Numerical studies on the high-order fractional Laplacian, 4th Annual Meeting of the SIAM Texas-Louisiana Section, South Padre Island, TX, 2021/11
1. Contributed talk: Numerical studies on the high-order fractional Laplacian, Midwest Numerical Analysis Day 2021, Rolla, MO, 2021/10

Awards

- Gaoxiong Gan Scholarship, Missouri S&T, 2022, 2023, & 2024
- Paul W. Eloe Graduate Research Award, Missouri S&T, 2022 & 2023
- 8th Annual Meeting of SIAM Central State Section Travel Award, 2023
- First place at the Pi Day Celebration Poster Session, Missouri S&T, 2023
- Graduate Education Travel Fund, Missouri S&T, 2023
- Nonlocal School on Fractional Equations (NSFE) Travel Award, 2022
- Mathematics and Statistics Alumni Endowed Scholarship, Missouri S&T, 2022
- 7th Annual Meeting of SIAM Central State Section Travel Award, 2022

Teaching Experiences

Michigan State University

Instructor

MTH 133: Calculus II - Recitation *Aug. 2025 – Dec. 2025*
3 sections

Co-Instructor

Irreversible Processes in Plasma *Jan. 2025 – May 2025*
Postdocs and graduate students

Missouri University of Science and Technology

Instructor

MATH 3304: Elementary Differential Equations *Jan. 2023 – May 2023*
98 students in total, **CET score: 3.21**[1]

Co-Instructor

MATH 1214: Mathematics Calculus for Engineers I *Aug. 2020 – Dec. 2020*
61 students in total, **CET score: 3.5**

Referee for Professional Journals

- Mathematics and Computers in Simulation

Skills

- Proficient in numerical PDEs.
- Skilled in MATLAB, Python, Fortran, and LaTeX.
- Knowledgeable in data-driven machine learning

Professional Membership

- Society for Industrial and Applied Mathematics (SIAM) *Jan. 2021 – present*

[1] Course Evaluation of Teaching (CET) score range from 0 (poor) to 4 (excellent).