Chunyan Li

Postdoctoral scholar
Department of Mathematics
University of South Carolina
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Education

Ph.D. | ***Applied Mathematics*** Jan. 2018 – Dec. 2023
University of South Carolina Columbia, SC, 29208

- Advisors: Qi Wang
- Thesis: Deep Learning for Studying Materials Stability and Solving Thermodynamically Consistent PDES With Dynamic Boundary Conditions in Arbitrary Domains.

B.Sc. | ***Mathematics and Applied Mathematics, Honors Class*** Sep. 2014 - Jun. 2018
Xiangtan University Xiangtan, Hunan, China

Employment

Postdoctoral Scholar May 2025 - May 2026
Department of Mathematics, University of South Carolina Columbia, SC, 29208

Postdoctoral Scholar Jan. 2024 - May 2025
Department of Mathematics, The Penn State University State College, PA, 16801

Research Interests

- Artificial Intelligence for PDEs
- Artificial Intelligence for medicine and digital twins for health
- PDE-based data-driven modeling and computations
- Structure preserving numerical methods

Honors and Awards

14. SEC Emerging Scholars Fellowship AY 2022-2023
Graduate School, University of South Carolina

- Only **five recipients** among all graduate and postdoctoral students are selected in the university.

13. Graduate International Student Achievement Award Dec. 2023
University of South Carolina

- Only **two** international students are awarded each semester, one at the graduate level and one cat the undergraduate level

12. C.C. Royal Fellowship Apr. 2022
Graduate School, University of South Carolina

- C.C. Royal Fellowship is one of the Trustee Fellowships awarded to full-time graduate students who exhibit excellence in graduate study, research, and scholarship. Given annually to **one recipient** by the Graduate School at the University of South Carolina.

11. George W. Johnson Graduate Fellowship Apr. 2020 & May 2022
Department of Mathematics, University of South Carolina

- Given annually by the Department of Mathematics at the University of South Carolina, **one recipient** each year.

10. Outstanding First-Year ACM Student Apr. 2019
Department of Mathematics, University of South Carolina

- Given annually by the Department of Mathematics at the University of South Carolina, **one recipient** each year.

9. Xiangjiang Scholarship for Excellent Students Dec. 2017
Department of Mathematics, Xiangtan University

- Given annually for the top student by the Department of Mathematics at Xiangtan University.

8. Advanced Individual of Volunteer Activities May 2017
Xiangtan University

7. Scholarships for excellent students in honors class (4-year tuition fellowship) Sep.2014-Jun.2018
Xiangtan University

6. National Encouragement Scholarship Nov. 2016
Xiangtan University
- Given annually for the top student by the Department of Mathematics at the Xiangtan University, **one recipient** each year.

5. Outstanding Student Cadre May 2015
Xiangtan University

4. Second-class scholarship (Top 2/19) May 2015
Xiangtan University

3. Outstanding teacher of the MUJIN Volunteer organization, May 2015
Xiangtan University, China

2. Undergraduate National Mathematical Contest in Modeling
- 05/2015, Xiangtan University Third Prize
- 02/2016, Successful Participant (USA)
- 11/2016, Provincial First Prize
- 12/2016, National First Prize

1. National Mathematical Competition of the Math Major Undergraduate Student
- 11/2016, Provincial First Prize
- 11/2016, National Second Prize
- 12/2017, Provincial Third Prize

Grants and Travel Awards

4. **SPARC Graduate Research Grant** $5,000 May 2023 - Aug. 2024
   Only 49 recipients among all graduate students are selected by the office of the Vice President for Research at the University of South Carolina.
3. Travel Award by the ICERMS at Brown University for Mathematical and Computational Biology Jun. 2023
2. Travel Award by the ICERMS at Brown University for Mathematical and Scientific Machine Learning Jun. 2023
1. Travel Award by the 40th SEARCDE Conference $500 Nov. 2022

Teaching Experience

- **Instructor** at the Penn State University:
  - Spring 2025 - Math/CMPSCE 451 Numerical Computations
  - Fall 2024 - MATH 452 **Deep Learning Algorithms and Analysis**
  - Spring 2024 - Math/CMPSCE 451 **Numerical Computations**
- **Instructor** at University of South Carolina:
  - Spring 2020 - Math 115, PreCalculus.
- **Recitation Leader** at University of South Carolina:
  - Fall 2021 - Math 528 **Mathematical Foundation of Data Science and Machine Learning**
  - Fall 2019 - Math 142, Calculus II (2 sections).
  - Spring 2019 / Fall 2020 - Math 141, Calculus I (2 sections).
- **Mentor** at Xiangtan University:
  - Fall 2016 - mentor for class 2 in Department of Mathematics
  - Spring 2017 - mentor for honors class in Business School

  Facilitated weekly recitations and discussion sections and designed and administered monthly exams; recruited by the Department of Mathematics to mentor first-year students in Calculus and Linear Algebra.

PUBLICATIONS

Preprints Submitted

6. **Chunyan Li**, Yutong Mao, Xiao Liu, and Wenrui Hao. Data-driven spatiotemporal modeling reveals personalized trajectories of cortical atrophy in Alzheimer's disease. *Submitted. arXiv:2511.08847*.

Refereed Journals

5. **Chunyan Li**, Wenkai Yu, Qi Wang. Energy Dissipation Rate-Based Adaptive Sampling for Physics-Informed Neural Networks: Resolving Surface-Bulk Dynamics in Allen-Cahn Systems. ***International Journal of Numerical Analysis and Modeling*** (IF: 1.3) to appear, 2025.
4. **Chunyan Li**, Lu Wang, Kexun Li, Hongfei Deng, Yu Wang, Li Chang, Ping Zhou, Jun Zeng, Mingwei Sun, Hua Jiang, and Qi Wang. Machine-learning-enabled Prognostic Models for Sepsis. ***Intelligence-Based Medicine***, 10:100167 (2024) (IF: 2.298)
3. Hou, Jianguo, Jun Deng, **Chunyan Li**, and Qi Wang. Tracing and Forecasting Metabolic Indices of Cancer Patients Using Patient-Specific Deep Learning Models. ***Journal of Personalized Medicine*** 12, no. 5 (2022): 742. (IF: 4.453)
2. **Li, Chunyan**, Shehani T. Wetthasinghe, Huina Lin, Tianyu Zhu, Chuanbing Tang, Vitaly Rassolov, Qi Wang, and Sophya Garashchuk. Stability Analysis of Substituted Cobaltocenium [Bis (cyclopentadienyl) cobalt (III)] Employing Chemistry-Informed Neural Networks. ***Journal of Chemical Theory and Computation*** 18, no. 5 (2022): 3099-3110. (IF: 6.006)
1. Wetthasinghe, Shehani T., **Chunyan Li**, Huina Lin, Tianyu Zhu, Chuanbing Tang, Vitaly Rassolov, Qi Wang, and Sophya Garashchuk. Correlation between the Stability of Substituted Cobaltocenium and Molecular Descriptors. ***The Journal of Physical Chemistry A*** 126, no. 1 (2022): 80-87. (IF: 2.781)

MENTORING EXPERIENCES

University of South Carolina – Columbia, SC, US

Mentor in REU Summer School — Summer 2025

- Lectures on time series classification problem with image encoding methods such as Gramian Angular Fields, Markov Transition Field, Recurrence plots, Fuzzy Recurrence plot, Wavelet Scalograms, etc..
- Meet with 3 undergraduate students every week to update the progress and provide feedback of the applications of image encoding techniques on real medical longitudinal data.

Mentor in REU Summer School — Summer 2022

- Lectures on PyTorch programming.
- Meet with students for at least 2 hours every day to update the research projects for each group (5 undergraduate students in 2 groups).
- Mentor 3 students in group I to learn Neural Ordinary Differential Equation (NODE) and how to program using its package, and guide students to do research on "predicting biomarkers of cancer patients using NODE".
- Mentor 2 students in group II to learn Physics Informed Neural Network (PINN) and how to program using DeepXDE package and guide students to do research on "solving a Partial Differential Equation using PINN".

MEMBERSHIPS OF PROFESSIONAL SOCIETIES

Society for Industrial and Applied Mathematics (SIAM) — 2018-Current
Association for Women in Mathematics (AWM) — 2024-Current

PROFESSIONAL SERVICE

- **Referee for Journals (Total number of 2 journals / 5 papers / 5 reviews)**:
  2. Mathematical Methods in the Applied Sciences - (4 papers / 4 reviews)
  1. *Chaos:* An interdisciplinary Journal of Nonlinear Science - (1 paper / 1 review)
- Organizer of the Applied and Computational Mathematics (ACM) Student Seminar in University of South Carolina — 2021-2023
- Vice president at SIAM student chapter of University of South Carolina — 2020-2022

Computer Skills

Main skills **Matlab**, Python, Pytorch, LaTeX, Markdown

Conferences and Presentations

1. 2025 SIAM Conference on Computational Science and Engineering, Fort Worth, Texas, US, (presentation) Mar. 2025
2. Minisymposium on Data Science, Discrete Math, and Theoretical Computing, the 2024 SIAM New York-New Jersey-Pennsylvania Section Conference (SIAM-NNP 2024), Rochester, NY, US, (presentation) Nov. 2024
3. Minisymposium on Model-Free Long-Horizon Time Series Forecasting with Mamba and Bayesian Neural Networks, the 2024 SIAM on Conference on Mathematics of Data Science (MDS24), Atlanta, Georgia, US, (presentation & poster) Oct. 2024
4. Minisymposium on Computational Mathematics for Engineering and Sciences, State College, PA, US, (poster) Nov. 2023
5. Workshop on Mathematical and Computational Biology, ICERM, Brown University, Providence, RI, US, (poster) Jun. 2023
6. Minisymposium on Methods, Models, and Analysis of Complex Systems, 2023 SIAM Southeastern Atlantic Section Annual Meeting (SIAM SEAS), Virginia Tech, VA, US, (presentation) Mar. 2023
7. Artificial Intelligence for Sensing and Diagnosis Core Breakout Session AI for Medical Research and Treatment, The National Big Data Health Science Conference, Columbia, SC, US, (presentation) Feb. 2023
8. The 40th Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE), Raleigh, NC, US, (presentation) Nov. 2022
9. The 2022 Made in SC Research Fellows and Faculty Conference and Celebration, Greenville, SC, US. (poster) Oct. 2022