Changjian Xie

CONTACT INFORMATION	Department of Mathematics National University of Singapore Block S17, 10 Lower Kent Ridge Road Singapore, 119076 Email: macjxie@nus.edu.sg Homepage: https://stevencjxie8.com/html/default.html https://blog.nus.edu.sg/macjxie/

RESEARCH INTERESTS

- Numerical methods and analysis for micromagnetics simulations;
- Molecular and spin dynamics modeling;
- Modeling and simulation for free boundary and interface problems;
- Machine learning methods and applications to scientific computing;

EDUCATION

School of Mathematical Sciences, Soochow University

Ph.D. in Mathematics (July 2021)

- Advisor: Prof. Jingrun Chen
- Research Topic: Numerical methods and analysis for Landau-Lifshitz equation

Hefei Normal University, Anhui Province, China

B.A. in Mathematics, July 2016

RESEARCH EXPERIENCE

Department of Mathematics, NUS

Research fellow (August 2022–present)

- Advisor: Prof. Weiqing Ren
- Research Topic: Numerical modeling and simulations for moving contact line problems.

Department of Mathematics, HKUST

Teaching post-doctoral fellow (August 2021–August 2022)

- Advisor: Prof. Xiaoping Wang
- Research Topic: Machine learning method for topology optimization.

VISITING EXPERIENCE

Visiting scholar to Penn State University, under the supervision of Prof. Xiantao Li (Nov. 2019–Oct. 2020), working on the molecular dynamics simulations.

Visiting scholar to Macau University, under the advice of Prof. Guanghui Hu (25 April, 2019–1 May, 2019), learning on AFEPack software and its application for demagnetization calculation

TEACHING EXPERIENCE

Calculus, MATH 1014 (Lecture and Tutorial); Instructor (2022 Spring, HKUST.)

Calculus; Instructor (2019 Spring, Soochow Univ.)

Applied Mathematics Topics: Using Mathematical Languages to Study Practical Problems; TA (2018 Spring, Soochow Univ.)

Numerical PDEs; TA (2018 Spring, Soochow Univ.)

Analytic Geometry; TA (2018 Fall, Soochow Univ.)

PUBLICATIONS   Yongyong Cai, Jingrun Chen, Cheng Wang, Changjian Xie. *Error analysis of a linear numerical scheme for the Landau-Lifshitz equation with large damping parameters.* Math. Methods Appl. Sci., 2023, doi: https://doi.org/10.1002/mma.9601

Yongyong Cai, Jingrun Chen, Cheng Wang, Changjian Xie. *A second-order numerical method for Landau-Lifshitz-Gilbert equation with large damping parameters.* J. Comput. Phys., 2022, vol 451, p.110831, doi: 10.1016/j.jcp.2021.110831.

Jingrun Chen, Cheng Wang, Changjian Xie. *Convergence analysis of a second-order semi-implicit projection method for Landau-Lifshitz equation.* Appl. Numer. Math., 2021, vol. 168, pp.55–74, doi: 10.1016/j.apnum.2021.05.027.

Changjian Xie, Carlos J. García-Cervera, Cheng Wang, Zhennan Zhou, and Jingrun Chen, *Second-order semi-implicit projection methods for Landau-Lifshitz equation,* J. Comput. Phys., 2020, vol. 404, p. 109104, doi: 10.1016/j.jcp.2019.109104.

Panchi Li, Changjian Xie, Rui Du, Jingrun Chen, Xiaoping Wang, *Two improved Gauss-Seidel projection methods for Landau-Lifshitz-Gilbert equation,* J. Comput. Phys., 2019, vol. 401, p. 109046, doi: 10.1016/j.jcp.2019.109046.

PREPRINTS   Changjian Xie, Xiantao Li, Jingrun Chen. *A machine-learning method for time-dependent wave equations over unbounded domains.* ArXiv:2101.05807, 2022.

ATTENDING
CONFERENCE
TALKS   *Second-order semi-implicit projection method and analysis for micromagnetics simulations,* 13th Annual Conference, CSCM2021, Nanjing, China, 2023

Second-order semi-implicit projection methods for Landau-Lifshitz equation, 7th Representative Congress, Society for Industrial and Applied Mathematics of Jiangsu Province (JSIAM), Nanjing, China, 2018. (December 2018)

Second-order semi-implicit projection methods for Landau-Lifshitz equation, 17th Annual Conference, China Society for Industrial and Applied Mathematics (CSIAM), Foshan, China, 2019. (September 2019)

A machine-learning method for time-dependent wave equations over unbounded domains, 4th Student Symposium of China Society for Industrial and Applied Mathematics (CSIAM), online, 2020. (November, 2020)

HONORS   2018   JSIAM Graduate International Symposium (outstanding winner)

2019   Grant for the Postgraduate Research and Practice Innovation Program of Jiangsu Province via number KYCX19_1947 working on numerical methods and analysis for Landau-Lifshitz equation

Program under the grant of China Scholarship Council via number 201906920043 working on the molecular and spin dynamics modeling

GRADUATE COURSEWORK	❏ Real Analysis	❏ Stochastic Partial Differential Equations
	❏ Functional Analysis	❏ Landau-Lifshitz Equation
	❏ Advanced Statistics	❏ Quantum Mechanics
	❏ An introduction to Homogenization	❏ Machine Learning
	❏ Introduction to Solid Materials	❏ Numerical Partial Differential Equations

RELEVANT SKILLS

Languages: Chinese (native), English (fluent)
Programming: Linux, C, C++, Fortran, Matlab, Python (Tensorflow, Pytorch)