Chenyang Li

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Personal Information

- **Date of Birth:** October 4, 1999.
- **Nationality:** China.

Education

- **East China Normal University** *Sept. 2023-Present*

  Ph.D. student in Computational Mathematics. Shanghai, China
  - **Address:** School of Mathematical Sciences, East China Normal University, Shanghai 200241, China.
  - **Concentration:** Numerical analysis and simulation of incompressible flow coupled with multi-physics fields.
  - **Supervisor:** Haibiao Zheng, Professor, School of Mathematical Sciences and Shanghai Key Laboratory of Pure Mathematics and Mathematical Practice, East China Normal University, Shanghai 200241,China. (hbzheng@math.ecnu.edu.cn)

- **Wenzhou University** *Sept. 2020-Jul. 2023*

  M.S. in Computational Mathematics. Wenzhou, China
  - **Address:** College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.
  - **Concentration:** Finite element discretizations for incompressible flow with variable density.
  - **Dissertation:** Research on the first-order Euler finite element algorithm for two-dimensional variable density MHD system.
  - **Supervisor:** Yuan Li (Associate Professor, liyuan@wzu.edu.cn) &. Rong An (Professor, anrong@wzu.edu.cn). College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.

- **Zhejiang Ocean University** *Sept. 2016-Jul. 2020*

  B.S. in Mathematics and Applied Mathematics (Normal Major). Zhoushan, China
  - **Address:** School of Information Engineering, Zhejiang Ocean University, Zhoushan 316000, China.
  - **Dissertation:** The integration of mathematical modeling concepts into secondary school mathematics.

Experience

- **University of Dundee** *15.Sept. 2025-15.Sept. 2026*

  Associate Staff in School of Science and Engineering. Dundee, UK
  - **Address:** School of Science & Engineering, University of Dundee, Dundee DD1 4HN, United Kingdom.
  - **Concentration:** Numerical analysis and simulation of Phase-Field Models.
  - **Host:** Ping Lin, Chair (Professor) of Numerical Analysis/Computational Math (2007 –now), School of Science and Engineering, University of Dundee, UK (p.lin@dundee.ac.uk)

- **Xinjiang University** *Aug. 2025*

  Academic visitor in College of Mathematics and System Sciences Urumqi China
  - **Address:** College of Mathematics and System Sciences, Xinjiang University, Urumqi, 830046, PR China
  - **Host:** Jianping Zhao, Professor of College of Mathematics and System Sciences, Xinjiang University, Urumqi, 830046, PR China.

• **University of Science and Technology of China** *Aug. 2024*

Participant in The Fourth Summer School on Computational and Numerical Methods for Partial Differential Equations. Hefei, China

◦ **Address:** School of Mathematical Sciences, University of Science and Technology of China, Hefei 230026, Anhui, China.

Research Interests

Computational fluid dynamics, Numerical solution of partial dierential equations (PDEs), Finite element methods, Stabilized mixed finite element methods.

- Numerical analysis and simulation of the time-dependent coupling model including Navier-Stokes equation, Stokes-Darcy System, Natural Convection Model, Magnetohydrodynamics (MHD) System, Chemotaxis–Navier-Stokes System.
- The time-dependent coupling model with variable density including Navier-Stokes Equation with variable density, Natural Convection Model with variable density, Magnetohydrodynamics System with variable density, Ericksen-Leslie system with variable density.

Technical skills

- **Programming:** FreeFem++, TecPlot, Paraview, Matlab, LaTeX, Fenics.
- **Writing:** Research manuscripts, funding proposals.

Research Experience

[1] Algorithm study of the incompressible magnetohydrodynamic equations with variable density in 2D. Xinmiao Talents Program of Zhejiang Province, **Principal Investigator (P.I.)**, Fiscal Year 2022-2024.

[2] Convergence analysis of finite element discrete scheme for the incompressible magnetohydrodynamics system with variable density. the Master's Innovation Foundation of Wenzhou University. **Principal Investigator (P.I.)**, Fiscal Year 2022-2023.

[3] Error analysis of first-order Euler linearized finite element scheme for the 2D magnetohydrodynamics system with variable density. The Innovation Foundation of Wangxiaoan in Wenzhou University, **Principal Investigator (P.I.)**, Fiscal Year 2022-2023.

[4] Blow up and Existence of the solutions for biological chemotaxis models. The Innovation Foundation of Zhejiang Ocean University. **Principal Investigator (P.I.)**, Fiscal Year 2018-2019.

Honors and Awards

• CSC Scholarship, China Scholarship Council, China, 2025.

• Graduate Academic Scholarship, East China Normal University, Shanghai, China. 2023-2024

• Outstanding Graduates of Zhejiang Province, Wenzhou, China. 2023. June.

• Outstanding Graduates of Zhejiang Ocean University, Zhoushan, China. 2020. June.

Publications

[1] **Chenyang Li**, Haibiao Zheng. Temporal error analysis of a BDF2 time-discrete scheme for the incompressible Navier-Stokes equations with variable density. Journal of Computational and Applied Mathematics 474 (2026): 0377-0427.

[2] Atrout Sabah, Md. Abdullah Al Mahbub, **Chenyang Li**, and Haibiao Zheng. Efficient and Long-Time Accurate Second-Order Decoupled Method for the Blood Solute Dynamics Model. International Journal of Numerical Analysis and Modeling. 23.1 (2026): 24-62.

[3] **Chenyang Li**, Yuan Li. Optimal L2 error analysis of first-order Euler linearized finite element scheme for the 2D magnetohydrodynamics system with variable density. Computers and Mathematics with Applications 128 (2022): 96-107.

[4] **Chenyang Li**, Jian Sun, Hailiang Zhang. Introduction of Several Biological Population Models. Hans Journal of Computational Biology. 09(04):80-85.

Ongoing Works

[1] Yuan Li, **Chenyang Li**, Xuewei Cui. Spatial error analysis of a new Euler finite element scheme for the incompressible flows with variable density. Submitted.

[2] Li Hang, **Chenyang Li***. Error analysis of a Euler finite element scheme for Natural convection model with variable density. https://doi.org/10.48550/arXiv.2504.04381, Journal of Applied Mathematics and Computing. Submitted.

[3] **Chenyang Li***, Yuze Lu, Haibiao Zheng. Error Estimate of a linearized Second-order Fully Discrete Finite Element Method for the bioconvection flows with concentration dependent viscosity. https://doi.org/10.48550/arXiv.2504.04357, Journal of Computational Mathematics. Submitted.

[4] **Chenyang Li**. Fully discrete finite element approximation for the projection method to solve the Chemotaxis-Fluid System. https://doi.org/10.48550/arXiv.2506.06792.

[5] **Chenyang Li**. A decoupled Crank-Nicolson leap-frog scheme for the unsteady bioconvection flows problem with concentration dependent viscosity. https://doi.org/10.48550/arXiv.2510.14034.

[6] **Chenyang Li**. Unconditionally stable Gauge–Uzawa finite element schemes for the chemo-repulsion Navier-Stokes system. https://doi.org/10.48550/arXiv.2510.27026.

References

1. **Yuan Li**
   Associate Professor, College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.
   Email: liyuan@wzu.edu.cn
   Relationship: M. S. Advisor.

2. **Rong An**
   Professor, College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.
   Email: anrong@wzu.edu.cn
   Relationship: M. S. Advisor.

3. **Haibiao Zheng**
   Professor, School of Mathematical Sciences and Shanghai Key Laboratory of Pure Mathematics and Mathematical Practice, East China Normal University, Shanghai 200241,China.
   Email: hbzheng@math.ecnu.edu.cn
   Relationship: Ph.D. Advisor.

4. **Ping Lin**
   Chair (Professor) of Numerical Analysis/Computational Math (2007 –now), School of Science and Engineering, University of Dundee, UK.
   Email: p.lin@dundee.ac.uk
   Relationship: Host in School of Science & Engineering, University of Dundee.