

# Chenyang Li

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## EDUCATION

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### • 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, Associate Professor, School of Mathematical Sciences and Shanghai Key Laboratory of Pure Mathematics and Mathematical Practice, East China Normal University, Shanghai 200241, China.

### • 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) & Rong An (Professor). 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.

## PERSONAL INFORMATION

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• **Date of Birth:** October 4, 1999.

• **Nationality:** China.

## RESEARCH INTERESTS

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Computational fluid dynamics, Numerical solution of partial differential 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

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

## RESEARCH EXPERIENCE

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- [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

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- 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.

## REFEREED JOURNAL PUBLICATIONS AND ONGOING WORKS

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- [1] **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. 
- [2] Yuan Li, **Chenyang Li**, Xuwei Cui. Spatial error analysis of a new Euler finite element scheme for the incompressible flows with variable density. [Submitted](#).
- [3] **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. [Submitted](#).
- [4] Atrout Sabah, Md. Abdullah Al Mahbub, **Chenyang Li**, and Haibiao Zheng. Eicient and Long-Time Accurate Second-Order Decoupled Method for the Blood Solute Dynamics Model. International Journal of Numerical Analysis and Modeling. [Submitted](#).
- [5] 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>, Communications in Nonlinear Science and Numerical Simulation. [Submitted](#). 
- [6] **Chenyang Li**\*, Yuzu 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](#). 
- [7] **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>. 
- [8] **Chenyang Li** , Chunchi Liu, Yizhong Sun, Haibiao Zheng. Error estimate of parallel decoupled stabilized finite element algorithm for the fully mixed Stokes-Darcy Problems. [Under Preparation](#).
- [9] **Chenyang Li**, Yuzu Lu. Unconditional Convergence Of High-Order Extrapolations Of The Crank-Nicolson, Finite Element Method For the bioconvection flows with concentration dependent viscosity. [Under Preparation](#).
- [10] **Chenyang Li**, Xiaohe Yue, Haibiao Zheng. Analysis of mixed finite element method for Instationary Stokes-Biot Coupled Problem. [Under Preparation](#).
- [11] **Chenyang Li**, Haibiao Zheng. A Second Order Accurate Scalar Auxiliary Variable Numerical Method for the chemo-repulsion-Navier-Stokes system. [Under Preparation](#).

## REFERENCES

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1. **Haibiao Zheng**

Associate 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.*

2. **Yuan Li**

Associate Professor, College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.

Email: liyuan@wzu.edu.cn

*Relationship: M. S. Advisor.*

3. **Rong An**

Professor, College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.

Email: anrong@wzu.edu.cn

*Relationship: M. S. Advisor.*