Cao-Kha Doan

Curriculum Vitae

Auburn University
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Google Scholar

Education

2021–2026 **Ph.D. in Applied Mathematics**, Auburn University, USA.
Advisor: Prof. Thi-Thao-Phuong Hoang.

2017–2021 **B.S. in Mathematics - Minor in Education**, Ho Chi Minh City University of Education, Vietnam.

2014–2017 **Honors class in Mathematics**, Le Khiet High School for the Gifted, Vietnam.

Research Interests

1. Transferable neural networks (TransNet) for time-dependent partial differential equations.
2. Dynamically regularized Lagrange multiplier (DRLM) methods for Navier-Stokes equations and the coupled Cahn-Hilliard-Navier-Stokes system.
3. Low regularity integrators (LRIs) for phase field models.
4. Noniterative localized exponential time differencing (LETD) methods for hyperbolic conservation laws and shallow water equations.

Publications

1. **Doan, C. K.**, Hoang, T. T. P., Ju, L., & Lan, R. (2026). Convergence analysis of the dynamically regularized Lagrange multiplier method for the incompressible Navier-Stokes equations. *IMA Journal of Numerical Analysis*, drag016.
2. **Doan, C. K.**, Hoang, T. T. P., Ju, L., & Lan, R. (2025). Dynamically regularized Lagrange multiplier method for the Cahn-Hilliard-Navier-Stokes system. *International Journal for Numerical Methods in Engineering*, 126(13), e70074.
3. **Doan, C. K.**, Huynh, P. T., & Hoang, T. T. P. (2025). Non-iterative localized exponential time differencing method for hyperbolic conservation laws. *Advances in Computational Mathematics*, 51(3), 26.
4. **Doan, C. K.**, Hoang, T. T. P., Ju, L., & Lan, R. (2025). Dynamically regularized Lagrange multiplier schemes with energy dissipation for the incompressible Navier-Stokes equations. *Journal of Computational Physics*, 521, 113550.
5. **Doan, C. K.**, Hoang, T. T. P., & Ju, L. (2024). Low regularity integrators for the conservative Allen-Cahn equation with a nonlocal constraint. *Journal of Scientific Computing*, 101(3), 57.
6. **Doan, C. K.**, Hoang, T. T. P., & Ju, L. (2023). Fully discrete error analysis of first-order low regularity integrators for the Allen-Cahn equation. *Numerical Methods for Partial Differential Equations*, 39(5), 3594-3608.
7. **Doan, C. K.**, Hoang, T. T. P., Ju, L., & Schratz, K. (2023). Low regularity integrators for semilinear parabolic equations with maximum bound principles. *BIT Numerical Mathematics*, 63(1), 2.
8. Vo, V. N., **Doan, C. K.**, & Nguyen, G. B. (2022). A regularity result via fractional maximal operators for p-Laplace equations in weighted Lorentz spaces. *Complex Variables and Elliptic Equations*, 67(7), 1737-1755.
9. Nguyen, T. N., Tran, M. P., **Doan, C. K.**, & Vo, V. N. (2021). A gradient estimate related fractional maximal operators for a p-Laplace problem in Morrey spaces. *Taiwanese Journal of Mathematics*, 25(4), 809-829.
10. Vo, V. N., Vo, V. H., Dang, V. Q. T., **Doan, C. K.**, et al. (2020). Building an inventory of learning materials exploiting mobile augmented reality technology for spatial geometry. *HCMC University of Education - Journal of Science*, 17(11), 1934-1944.

Talks and Presentations

Conference Talks

1. The 4th Southeast Applied and Computational Math Student Workshop, Emory University, GA, April 3-4, 2026.
2. SIAM New York-New Jersey-Pennsylvania Section Conference, Pennsylvania State University, PA, October 31-November 2, 2025.
3. The 12th Annual Graduate Student Mini-Conference in Computational Mathematics, Clemson University, SC, September 27-28, 2025.
4. SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, TX, March 3-7, 2025.
5. The 9th SIAM Central States Section Annual Meeting, University of Missouri-Kansas City, MO, October 5-6, 2024.
6. The 11th Annual Graduate Student Mini-Conference in Computational Mathematics, Clemson University, SC, April 20, 2024.
7. The 8th SIAM Central States Section Annual Meeting, University of Nebraska-Lincoln, NE, October 7-8, 2023.
8. AMS Fall Eastern Sectional Meeting, University at Buffalo, NY, September 9-10, 2023.
9. SIAM Southeastern Atlantic Section Annual Meeting, Virginia Tech, VA, March 25-26, 2023.
10. The 10th Annual Graduate Student Mini-Conference in Computational Mathematics, Auburn University, AL, December 10, 2022.

Seminar Talks

1. Applied and Computational Mathematics Seminar, Auburn University, AL, September 20, 2024.
2. Applied and Computational Mathematics Seminar, Auburn University, AL, September 1, 2023.
3. COSAM Graduate Student Research Forum, Auburn University, AL, February 15, 2023.
4. Graduate Student Seminar, Auburn University, AL, September 7, 2022.

Poster Presentations

1. The 54th John H. Barrett Memorial Lectures, University of Tennessee, Knoxville, TN, May 18-20, 2026.
2. Southeast Applied and Computational Math Student Workshop, Auburn University, AL, April 5-6, 2025.
3. SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, TX, March 3-7, 2025.
4. Joint Alabama-Florida Conference on Differential Equations, Dynamical Systems and Applications, Auburn University, AL, May 13-14, 2023.

Teaching Experience

Instructor of Record

Fall 2025 MATH 1620 Calculus II

Recitation Leader

Fall 2024 MATH 2630 Calculus III

Fall 2023 MATH 1610 Calculus I

Substitute Instructor

Spring 2026 MATH 5630/6630 Introduction to Numerical Analysis I

Fall 2024 MATH 1627 Honors Calculus II

Spring 2024 MATH 5640/6640 Introduction to Numerical Analysis II

Fall 2022 MATH 1617 Honors Calculus I

Grader

Spring 2026 MATH 5630/6630 Introduction to Numerical Analysis I

Fall 2022 MATH 5630/6630 Introduction to Numerical Analysis I

Spring 2022 MATH 2660 Topics in Linear Algebra

Fall 2021 MATH 2650 Linear Differential Equations

Service

Mathematical Review

Journal of Computational Physics (1), Journal of Scientific Computing (2), Communications in Computational Physics (1), Numerical Algorithms (1), Scientific Reports (1).

Outreach

2025 Local Organizer, Southeast Applied and Computational Math Student Workshop, Auburn University.

2023 Teaching Assistant, Introduction to Applied and Computational Mathematics and Deep Learning, Summer Science Institute, Auburn University.

2022 Teaching Assistant, Introduction to Applied and Computational Mathematics, Summer Science Institute, Auburn University.

Honors and Awards

Auburn University, US

2026 Nominee, Auburn University Distinguished Dissertation Award. Selected as the sole nominee from the Department of Mathematics and Statistics.

2024 Baskervill Endowed Mathematics Fellowship.

2022 Baskervill Endowed Mathematics Fellowship.

2021 Don and Sandy Logan Endowed Fellowship.

Ho Chi Minh City University of Education, Vietnam

2021 Second Prize in Scientific Research Contest for Undergraduates, Department Round.

2020 First Prize in Scientific Research Contest for Undergraduates, University Round (with Van-Nghia Vo, Van-Hoa Vo, Ngoc-Huy Truong and Quang-Thinh Dang Vu).

2019 First Prize in Analysis and Second Prize in Algebra at National Mathematics Olympiad for Undergraduates.

2018 Second Prizes in Analysis and Algebra at National Mathematics Olympiad for Undergraduates.

Le Khiet High School for the Gifted, Vietnam

2017 Second Prize in the National Excellent Student Competition.

2016 Gold medal in the Student Math Olympiad Competition.

2015 Valedictorian in Hanoi Open Mathematics Competition.

Skills

Languages Vietnamese (Native), English (Fluent).

Coding MATLAB, Python, Mathematica.