Thuyen Dang

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Đặng Triển Thuyên

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Appointment

Tenure-track Assistant Professor Purdue University Northwest, USA. 2025—
Department of Mathematics and Statistics.

William H. Kruskal Instructor University of Chicago, USA. 2022—2025
Department of Statistics & Committee on Computational and Applied Mathematics.
Mentor: Guillaume Bal.

Research Interests

Analysis of PDEs with applications to Mathematical Modelling and Mathematical Physics.
• Mathematics of materials science • Quantum materials • Quantum computation • Optimal transport • Mathematical finance.

Education

Ph.D in Mathematics University of Houston, USA. 2018—2022
Thesis: *Homogenization of coupled problems of a fluid flow with magnetic particles.*
Advisors: Yuliya Gorb & Silvia Jiménez Bolaños.

M.Sc in Mathematics Université Sorbonne Paris Nord, France. 2015—2016
Thesis: *Statistics of visiting times on lattice sites of a random walk.*
Advisor: Denis S. Grebenkov. Rank: Très Bien.

B.Sc in Mathematics University of Science, VNU-HCM, Vietnam. 2011—2015
Thesis: *On the Palais-Smale condition.*
Advisor: Duong Minh Duc. Rank: High Distinction.

Publications

Submitted

[9] T. Dang, Y. Gorb, and S. Jiménez Bolaños. *A Point-Free Theory of Quantitative Homogenization*. Aug. 5, 2026. DOI: 10.48550/arXiv.2608.05077.

[8] T. Dang and D. M. Duc. *Global Boundedness of Solutions of Degenerate and Non-Uniform Parabolic Equations*. Sept. 27, 2025. DOI: 10.48550/arXiv.2509.23064.

[7] T. Dang, Y. Gorb, and S. Jiménez Bolaños. *Homogenization of a Semilinear Elliptic Problem*. Sept. 26, 2025. DOI: 10.48550/arXiv.2509.22859.

Journal Articles

[6] T. Dang, Y. Gorb, and S. Jiménez Bolaños. "Explicit Corrector in Homogenization of Monotone Operators and Its Application to Nonlinear Dielectric Elastomer Composites." *SIAM Journal on Mathematical Analysis* 58.3 (2026), pp. 2829–2864. ISSN: 0036-1410, 1095-7154. DOI: 10.1137/24M1721748.

[5] T. Dang, Y. Gorb, and S. Jiménez Bolaños. "Homogenization of High-Contrast Dielectric Elastomer Composites." *Multiscale Modeling & Simulation. A SIAM Interdisciplinary Journal* 23.1 (2025), pp. 668–685. ISSN: 1540-3459. DOI: 10.1137/24M1631420.

[4] G. Bal and T. Dang. "Topological Anderson Insulators by Homogenization Theory." *Communications in Partial Differential Equations* 49.10–12 (2024), pp. 989–1010. ISSN: 0360-5302. DOI: 10.1080/03605302.2024.2411522.

[3] T. Dang, Y. Gorb, and S. Jiménez Bolaños. "Homogenization of a Nonlinear Strongly Coupled Model of Magnetorheological Fluids." *SIAM Journal on Mathematical Analysis* 55.1 (2023), pp. 102–132. ISSN: 0036-1410. DOI: 10.1137/22M1476939.

[2] T. Dang, Y. Gorb, and S. Jiménez Bolaños. "Homogenization of Nondilute Suspension of Viscous Fluid with Magnetic Particles." *SIAM Journal on Applied Mathematics* 81.6 (2021), pp. 2547–2568. ISSN: 0036-1399. DOI: 10.1137/21M1413833.

Book Chapters

[1] T. Dang, Y. Gorb, and S. Jiménez Bolaños. "Global Gradient Estimate for a Divergence Problem and Its Application to the Homogenization of a Magnetic Suspension." *Research in Mathematics of Materials Science*. Ed. by M. I. Español, M. Lewicka, L. Scardia, and A. Schlömerkemper. Association for Women in Mathematics Series. Cham: Springer International Publishing, 2022, pp. 133–157. ISBN: 978-3-031-04496-0.

Talks & Presentations

24. *An algebraic approach to multiscale analysis (invited talk)*, 2027 Joint Mathematics Meetings, Chicago, Illinois. January 12—15, 2027
23. *A point-free approach to homogenization and applications (seminar talk)*, Harmonic Analysis and Differential Equations Seminar, University of Illinois Urbana-Champaign, Illinois. November 10, 2026
22. *A point-free approach to homogenization and applications (seminar talk)*, L. Berlyand's Interdisciplinary Mathematics Group, Pennsylvania State University, Pennsylvania. October 23, 2026
21. *Topological Anderson insulator by mathematical homogenization (invited talk)*, 2026 SIAM Annual Meeting, Cleveland, Ohio. July 6—10, 2026
20. *Homogenization in Materials Science and Mathematical Physics (colloquium)*, Purdue University Northwest, Indiana. March 6, 2025
19. *Calculus of variations: from Poisson equations to Feynman path integrals (public lecture)*, UChicago Math Club, University of Chicago, Illinois. November 19, 2024
18. *Topological Anderson insulator by mathematical homogenization (contributed talk)*, SIAM New York-New Jersey-Pennsylvania Section Conference, Rochester Institute of Technology, New York. November 1—3, 2024
17. *Topological Anderson insulator by mathematical homogenization (colloquium)*, Colgate University, New York. November 1, 2024
16. *Topological Anderson insulator by mathematical homogenization (colloquium)*, University of Chicago, Illinois. October 24, 2024
15. *Topological Anderson insulator by mathematical homogenization*, SIAM Conference on Mathematical Aspects of Materials Science, Pittsburgh, Pennsylvania. May 23, 2024
14. *Topological Anderson insulator by mathematical homogenization (seminar talk)*, Analysis and Applied Mathematics Seminar, University of Illinois at Chicago. November 27, 2023
13. *Homogenization of nonlinear deformable dielectrics (invited talk)*, MAA MathFest 2023, Tampa, Florida. Aug 2—5, 2023
12. *Homogenization of some coupled models arising from mixtures of magnetic particles with a matrix material (invited talk)*, 2023 Joint Mathematics Meetings, Boston, Massachusetts. January 4—7, 2023
11. *Homogenization of a non-linear strongly coupled model of magnetorheological fluids (poster, online)*, Trends in Calculus of Variations and PDEs, University of Sussex, United Kingdom and Ghent Analysis & PDE Centre, Ghent University, Belgium. May 10—20, 2022
10. *An invitation to mathematical homogenization*, Graduate Student Paper Presentation 2022, University of Houston, USA. April 29, 2022

9. *A tour of periodic homogenization and its applications (colloquium)*, Colgate University, New York. April 7, 2022
8. *A simplified model for magnetorheological fluid and its corresponding effective system (invited talk)*, 4th Annual Meeting of the SIAM Texas-Louisiana Section, SIAM Texas-Louisiana Section and the University of Texas Rio Grande Valley, South Padre Island, Texas. November 5—7, 2021
7. *A simplified model for magnetorheological fluid and its corresponding effective system (seminar talk, online)*, Oberseminar Mathematik in den Naturwissenschaften, Julius - Maximilians - Universität Würzburg, Germany. October 21, 2021
6. *Global gradient estimate and application to homogenization of a magnetic suspension (poster, online)*, V Workshop on Fluids and PDE, UNICAMP Universidade Estadual de Campinas, Brazil. September 20—October 1, 2021
5. *Global gradient estimate and application to homogenization of a magnetic suspension (poster, online)*, The 30th Jyväskylä Summer School, University of Jyväskylä, Finland. August 9—20, 2021
4. *Homogenization of non-dilute suspension of a viscous fluid with magnetic particles (special session: Diverse Aspects of Elliptic PDEs and Related Problems, online)*, Mathematical Congress of the Americas 2021, Universidad de Buenos Aires and Universidad de Buenos Aires-Conicet, Argentina. July 12—23, 2021
3. *Homogenization of non-dilute suspension of a viscous fluid with magnetic particles (minisymposium: Mathematical modeling and analysis of problems in materials science and fluid dynamics, online)*, SIAM Conference on Mathematical Aspects of Materials Science, Basque Center for Applied Mathematics, Bilbao, Spain. May 17—28, 2021
2. *An effective model for magnetorheological fluids via homogenization (online)*, Graduate Student Paper Presentation 2021, University of Houston, USA. April 23, 2021
1. *Homogenization of one-way coupled Stokes flow with paramagnetic inclusions (contributed talk, online)*, Texas Analysis and Mathematical Physics Symposium 2020/21, University of Texas at Austin, USA. April 9—11, 2021

Conferences, Workshops & Visits

27. *SIAM Conference on Mathematical Aspects of Materials Science*, Bellevue, Washington. May 2—5, 2027
26. *2027 Joint Mathematics Meetings*, Chicago, Illinois. January 12—15, 2027
25. *2026 SIAM Annual Meeting*, Cleveland, Ohio. July 6—10, 2026
24. *SIAM New York-New Jersey-Pennsylvania Section Conference*, Rochester Institute of Technology, New York. November 1—3, 2024

23. *SIAM Conference on Mathematical Aspects of Materials Science*, Pittsburgh, Pennsylvania. May 19—23, 2024
22. *MAA MathFest 2023*, Tampa, Florida. Aug 2—5,2023
21. *2023 Joint Mathematics Meetings*, Boston, Massachusetts. January 4—7, 2023
20. *Trends in Calculus of Variations and PDEs (online)*, University of Sussex, United Kingdom and Ghent Analysis & PDE Centre, Ghent University, Belgium. May 10—20, 2022
19. *SIAM 2022 Conference on Analysis of Partial Differential Equations (online)*, Virtual Conference, Originally scheduled in Berlin, Germany. March 14—18, 2022
18. *4th Annual Meeting of the SIAM Texas-Louisiana Section*, SIAM Texas-Louisiana Section and the University of Texas Rio Grande Valley, South Padre Island, Texas. November 5—7, 2021
17. 25th Internet Seminar *Spectral theory for Operators and Semigroups*, Salerno, Italy. October 2021—June 2022
16. *V Workshop on Fluids and PDE (online)*, UNICAMP Universidade Estadual de Campinas, Brazil. September 20—October 1, 2021
15. *Young women in Partial Differential Equations and applications (online)*, Institute for Applied Mathematics, University of Bonn, Germany. September 20—22, 2021
14. *The 30th Jyväskylä Summer School (online)*, University of Jyväskylä, Finland. August 9—20, 2021
13. *Mathematical Congress of the Americas 2021 (online)*, Universidad de Buenos Aires and Universidad de Buenos Aires-Conicet, Argentina. July 12—23, 2021
12. *Hausdorff School on: Trending Tools for the Solvability of Nonlocal Elliptic and Parabolic Equations (online)*, Hausdorff Center for Mathematics, University of Bonn, Germany. June 28—July 2, 2021
11. *SIAM Conference on Mathematical Aspects of Materials Science (online)*, Basque Center for Applied Mathematics, Bilbao, Spain. May 17—28, 2021
10. *Texas Analysis and Mathematical Physics Symposium 2020-21 (online)*, University of Texas at Austin, USA. April 9—11, 2021
9. *ONEPAS Thematic Series - The mathematics of thin structures (7 sessions)*, Online North East PDE and Analysis Seminar, Carnegie Mellon University, USA. April 1—May 13, 2021
8. *Nonlinear Meeting 2021* (online), Differential Equations Group Of North-East, Italy. March 22—23, 2021
7. *Winter School on Analysis and Applied Mathematics (online)*, University of Münster, Germany. February 22—26, 2021
6. *Mathematical and Computational Materials Science Workshop (online)*, The Institute for Mathematical and Statistical Innovation, University of Chicago, USA. February 15—19, 2021

5. 23rd Internet Seminar *Evolutionary Equations*, Hamburg University of Technology, Germany. October 2019—February 2020
4. *Houston Summer School on Dynamical Systems 2019*, University of Houston, Texas, USA. May 30—June 6, 2019
3. *Houston Summer School on Dynamical Systems 2018*, University of Houston, Texas, USA. May 16—24, 2018
2. Mathematical Conference *Summer Meeting 2016*, University of Sciences, VNU-HCM, Vietnam. July 23—24, 2016
1. *Master Internship*, Laboratoire de Physique de la Matière Condensée, École Polytechnique, France. May 1—July 1, 2016

Teaching

Experience across the full range of the mathematics curriculum, from introductory calculus to graduate-level topics.

Curriculum & Course Development

- *Applied Mathematics in AI and Quantum Computing* 2026—
  Developed a new course for undergraduates at Purdue University Northwest in applied mathematics. The course introduces students to the mathematical foundations driving modern artificial intelligence and quantum computing.
- *Accessible Course Materials Project* 2026—
  Developed 4 comprehensive, accessibility-compliant textbooks for core mathematics courses (Calculus I & II, Differential Equations, and Linear Algebra) to support diverse learning needs at Purdue University Northwest.
- *Homogenization of Partial Differential Equations* 2024—2025
  Developed a new course for graduate students and advanced undergraduates at University of Chicago in applied mathematics. The course introduces students to the fundamental tools and techniques of homogenization theory, emphasizing its applications in materials science.
- *Basic Numerical Analysis* 2023—2025
  Authored a textbook-style draft in numerical analysis, integrating mathematical theory with Python programming, to teach students at the University of Chicago.

At Purdue University Northwest, Indiana, USA

Instructor. *Duties included preparing and teaching course materials, preparing and grading homework/exams, and holding office hours.*

MA 26500	Linear Algebra	Fall 2026
MA 16300	Integrated Calculus Analysis Geometry I	Fall 2026
MA 26400	Differential Equations	Spring 2026
MA 16400	Integrated Calculus Analysis Geometry II	Spring 2026

At University of Chicago, Illinois, USA

Instructor. *Duties included preparing and teaching course materials, preparing and grading homework/exams, and holding office hours.*

Caam 31260	Homogenization of Partial Differential Equations (graduate level)	Winter 2024, Winter 2025
Stat 25100	Introduction to Mathematical Probability	Autumn 2022, Autumn 2023, Autumn 2024
Stat 21100	Basic Numerical Analysis	Spring 2023, Spring 2024, Spring 2025

At Institute for Mathematical and Statistical Innovation, Illinois, USA

Instructor. *Duties included preparing and teaching course materials, preparing homework, and holding office hours.*

	Regression and Statistical Learning	Summer 2024

At University of Houston, Texas, USA

Teaching Assistant. *Duties included leading recitation sections, grading exams and homework, holding office hours and tutoring undergraduate students at university academic support centers MUSL and CASA.*

Math 5332	Differential Equations	Spring 2020
Math 3363	Introduction to Partial Differential Equations (2 sections)	Spring 2020
Math 3321	Engineering Mathematics	Spring 2020
Math 4335	Partial Differential Equations I	Fall 2019
Math 3364	Introduction to Complex Analysis	Fall 2019
Math 1431	Calculus I	Spring 2019, Summer 2019
Math 1330	Pre-Calculus	Summer 2019
Math 1310	College Algebra	Summer 2019

Math 3304	Elements of Mathematical Analysis	Spring 2019
Math 3305	Formal and Informal Geometry	Fall 2018
Math 3331	Ordinary Differential Equations	Spring 2018

At University of Science, VNU-HCM, Vietnam

Teaching Assistant *&* Instructor. *Duties included teaching course materials, leading recitation sections, preparing and grading exams, and holding office hours.*

TTH024	Analysis III	Fall 2017
MTH253	Calculus III for Advanced Program in Computer Science	Summer 2017
TTH104	Functional Analysis	Spring 2017
TTH022	Analysis I – Calculus	Fall 2015
TTH021	Analysis I – Basic Analysis	Fall 2015

Services

Research Supervision and Mentoring

Ariel Trusty Purdue University Northwest, USA
Stacked Course (Honors College): Linear Regression and Regularization (2026).

Richard Chen University of Chicago, USA
Undergraduate Research: Markov brothers' inequality and estimation of Lebesgue constant in polynomial interpolation (2025).

Haoshu Wang University of Chicago, USA
Undergraduate Research: Homogenization of elliptic equations with complex potentials (2024).

Journals Refereed

- Archive for Rational Mechanics and Analysis
- Pure and Applied Analysis

Scientific Event Organization

6. Minisymposium Organizer, *Mathematical Analysis of Multiscale Materials, Metamaterials, and Wave Phenomena*, SIAM Conference on Mathematical Aspects of Materials Science, Bellevue, Washington. May 2—5, 2027
5. Minisymposium Organizer, *Deterministic and Stochastic PDEs in Heterogeneous and Composite Media: Analysis and Computation*, 2027 Joint Mathematics Meetings, Chicago, Illinois. January 12—15, 2027

4. Minisymposium Organizer, *Numerical Methods and Modeling for Multiphysics Problems*, 2026 SIAM Annual Meeting, Cleveland, Ohio. July 6—10, 2026
3. Item writer for the *Academic Super Bowl* (combinatorics and geometry), Purdue University Northwest, Indiana. March 11, 2026
2. Volunteer in *2024 South Side Science Festival*, University of Chicago. October 5, 2024
1. Minisymposium Organizer, *Mathematical Modeling of Microstructural Materials*, SIAM Conference on Mathematical Aspects of Materials Science, Pittsburgh, Pennsylvania. May 19—23, 2024

Committee Work

- Member of Course Committees: Calculus sequences and Mid/Upper-Level Math courses Spring 2026—
- Member of Math & Stat AI Fall 2026—
- Chair of Math & Stat ADA compliance (Americans with Disabilities Act) Fall 2026—

Other Activities

5. Delivered expository lecture *Adding Things Up* in PNW Concurrent Enrollment Programs Professional Day for High School Mathematics Instructors. November 13, 2026
4. Established a standardized workflow for creating fully accessible mathematics teaching materials for Department of Mathematics and Statistics, Purdue University Northwest. Fall 2026—
3. Represented the Department of Mathematics and Statistics at the *Purdue University Northwest Welcome Rally* on the Hammond Campus. Spring 2026, Fall 2026
2. Volunteer as meal prepper in *Ronald McDonald House Meals* (prepare home cooked meals for families whose children are in the the University of Chicago Comer Children's Hospital on South Drexel St). November 10, 2023
1. Participate in Lucheon/Discussion *Experience as a Graduate Student*, Colgate University. April 7, 2022

Honors & Awards

9. Winner of Graduate Student Paper Presentation, University of Houston, USA 2022
8. M.Sc degree with Honors (Très Bien), Université Sorbonne Paris Nord, France. 2016
7. B.Sc degree with Honors (Rank 2/300), University of Science, VNU-HCM, Vietnam. 2015

6. VIASM Fellowships for Excellent Students in Mathematics, Vietnam Institute for Advanced Study in Mathematics. 2012—2015
5. Scholarships for Excellent Students, University of Science, VNU-HCM, Vietnam. 2011—2015
4. Odon Vallet Scholarship. 2011
3. Third Prize, Vietnamese Mathematical Olympiad. 2011
2. Silver Medal in Mathematics, Traditional Olympiad of Southern Vietnam - Grade 11, Vietnam. 2010
1. Silver Medal in Mathematics, Traditional Olympiad of Southern Vietnam - Grade 10, Vietnam. 2009

Technical Skills

Software LaTeX, Emacs, Git, Matlab/Octave, Inkscape.

Programming language Python, Julia, R, C.

Languages

Vietnamese Native **English** Fluent

French Beginner

Last updated: November 16, 2026.