

Tongtong Li

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EMPLOYMENT

Research Associate

Department of Mathematics, Dartmouth College

August 2021 — Present

Hanover, NH

- Recipient of SIAM Early Career Travel Award

EDUCATION

Doctor of Philosophy in Mathematics, July 2021

University of Pittsburgh

Pittsburgh, PA

GPA: 4.00

- Recipient of Mathematics Teaching Assistant Excellence Award
- Arts and Sciences Graduate Fellowship (two times)
- Thesis Title: "*Mixed Formulations for Fluid-poroelastic Structure Interaction*"
- Advisor: Ivan Yotov

Master of Science in Mathematical Finance, June 2016

Rutgers, the State University of New Jersey

New Brunswick, NJ

GPA: 3.96

- Thesis Title: "*Pricing Finite-maturity European Put-Heston Option with Barrier Discontinuity by FDM*"
- Advisor: David Eliezer

Bachelor of Economics, June 2014

Huazhong Agricultural University

Wuhan, China

GPA: 3.82 Valedictorian

- Recipient of National Scholarship (10/852, two times), Best College Student Award (8/18625), Xingfa Scholarship (20/852), Academic Scholarship (every year)
- First Class Award (Meritorious) in the Mathematical Contest in Modeling (COMAP MCM)
- Thesis Title: "*Research of Chinese Agricultural Commodity Futures Market Volatility Spillover Effect Based on BEKK-GARCH Model – Taking DCE Yellow Soybean as an Example*"
- Advisor: Guang Zeng

RESEARCH INTERESTS

Numerical analysis, solution of partial differential equations, finite element methods, interaction of fluid flow and poroelastic media, sea ice modeling, numerical solutions of conservation laws, data assimilation

PUBLICATIONS

Preprints

1. T. Li, A. Gelb and Y. Lee, *Improving numerical accuracy for the viscous-plastic formulation of sea ice*. [Arxiv](#). Submitted.
2. S. Caucao, T. Li and I. Yotov, *An augmented fully mixed formulation for the coupling of the quasi-static Navier-Stokes and Biot models*. In Preparation.
3. X. Wang, T. Li and I. Yotov, *Non-Newtonian and poroelastic effects in simulations of arterial flows*. [Arxiv](#). Preprint.

Refereed Journal Papers

1. S. Caucao, T. Li and I. Yotov, *A multipoint stress-flux mixed finite element method for the Stokes-Biot model*. *Numerische Mathematic*, to appear (2022). [Arxiv](#).
2. T. Li and I. Yotov, *A mixed elasticity formulation for fluid-poroelastic structure interaction*. *ESAIM Math. Model. Numer. Anal.*, 56(1): 1–40, 2022. DOI: [10.1051/m2an/2021083](https://doi.org/10.1051/m2an/2021083).

Refereed Conference Proceedings

1. S. Caucao, T. Li and I. Yotov, *A cell-centered finite volume method for the Navier-Stokes/Biot model*. In: Klöforn R., Keilegavlen E., Radu F., Fuhrmann J. (eds) *Finite Volumes for Complex Applications IX - Methods, Theoretical Aspects, Examples*. FVCA 2020. Springer Proceedings in Mathematics & Statistics, vol 323. Springer, Cham. DOI: [10.1007/978-3-030-43651-3_29](https://doi.org/10.1007/978-3-030-43651-3_29).

PRESENTATIONS

1. *Numerical methods on solving sea ice dynamics model based on a viscous-plastic formulation*. North American High Order Methods Conference (NAHOMCon), San Diego State University, July 2022.
2. *Numerical methods on solving sea ice dynamics model based on a viscous-plastic formulation*. SIAM Conference on Mathematical Planet Earth, Pittsburgh, PA, July 2022.
3. *Can we do better? – Exploring sea ice model from a numerical view*. Multidisciplinary University Research Initiatives (MURI) annual meeting, Dartmouth College, October 2021.
4. *A mixed elasticity model for flow in fractured poroelastic media*. SIAM Conference on Mathematical & Computational Issues in the Geosciences (online), June 2021.
5. *A new fully mixed formulation for the Stokes-Biot model*. Pitt AWM Student Seminar Series, University of Pittsburgh, June 2021.

6. *Mixed formulations for fluid-poroelastic structure interaction*. Sea Ice Modeling and Data Assimilation (SIMDA) Seminar, Dartmouth College, April 2021.
7. *Mixed finite element methods for fluid-poroelastic structure interaction*. Graduate Student Seminar, University of Pittsburgh, March 2021.
8. *Mixed formulations for fluid-poroelastic structure interaction*. Oden Institute Virtual Seminar, The University of Texas at Austin, March 2021.
9. *A cell-centered finite volume method for the Navier-Stokes/Biot model*. Finite Volumes for Complex Applications IX, Bergen, Norway (online), June 2020.
10. *A multipoint stress-flux mixed finite element method for the Stokes-Biot model*. Finite Element Circus, Virginia Polytechnic Institute and State University, November 2019.
11. *Introduction to tree-based methods*. Machine Learning Workshop, University of Pittsburgh, March 2019.

CONFERENCES AND WORKSHOPS

- *North American High Order Methods Conference (NAHOMCon)*. San Diego State University, July 2022.
- *SIAM Conference on Mathematical Planet Earth (MPE22)*. Pittsburgh, PA, July 2022.
- *(Hybrid) SIAM Conference on Uncertainty Quantification (UQ22)*. Atlanta, GA, April 2022.
- *Optimization Reading Group*. Dartmouth College, Spring 2022.
- *Tensorflow and Physics-informed Neural Network (PINN) Study Group*. Dartmouth College, Winter 2021.
- *Numerical Methods for Conservation Laws Study Group*. Dartmouth College, Fall 2021.
- *Computational Optimal Transport Reading Group*. Dartmouth College, Summer 2021.
- *(Hybrid) Finite Element Circus*. The Pennsylvania State University, November 2021.
- *SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)*. Milan, Italy (online), June 2021.
- *(Virtual) Finite Element Circus*. November 2020.
- *2nd Joint SIAM/CAIMS Annual Meeting (AN20) and SIAM Conference on Imaging Science (IS20)*. Toronto, Ontario, Canada (online) June, 2020.
- *Finite Volumes for Complex Applications IX*. Bergen, Norway (online), June 2020.
- *Finite Element Circus*. Virginia Polytechnic Institute and State University, November 2019.
- *Machine Learning Study Group*. University of Pittsburgh, Spring 2019.
- *Pitt Research Center for Research Computing Cluster Training Workshop*. University of Pittsburgh, Spring 2019.
- *Freefem++ Workshop*. University of Pittsburgh, August 2017.

ADDITIONAL RESEARCH PROJECTS

1. *Empirical analysis of the relationship between GDP and oil price in China: A Bootstrap approach*, with Miao Yang, 2015-2016.
2. *Portfolio construction based on the movement of oil price*, with Miao Yang, 2015-2016.
3. *Prediction on the supply/demand dynamics in horticulture industry*, with Taotao Tu, 2013-2014.
4. *Analysis on factors affecting online payment within college students based on Probit model*, with Huijuan Chen, 2013-2014.

TEACHING EXPERIENCE

Dartmouth College

Lecturer

- Topics in Applied Mathematics/Current Problems in Applied Mathematics Spring 2022

University of Pittsburgh

Lecturer

- Analytical Geometry and Calculus 2 (1 section) Summer 2021
- Applied Differential Equations (1 section) Summer 2020
- Analytical Geometry and Calculus 1 (1 section) Summer 2017

Teaching Fellow

2019-2021

- Analytical Geometry and Calculus 1 (1 section)
- Analytical Geometry and Calculus 3 (4 sections)

Teaching Assistant

2017-2019

- Analytical Geometry and Calculus 1 (3 sections)
- Analytical Geometry and Calculus 2 (3 sections)
- Analytical Geometry and Calculus 3 (3 sections)
- Introduction to Theoretical Mathematics (2 sections)
- University Honors College Introduction to Analysis (1 section)

Rutgers, The State University of New Jersey

Course Assistant

2015-2016

- Numerical Analysis I (1 section, Graduate Level)
- Computational Finance (1 section, Graduate Level)

ACTIVITIES

Dartmouth College

Volunteer Session Leader and Panel Speaker, Sonia Kovalevsky Math Day May 2022

University of Pittsburgh

Member, Math Department Graduate Student Organization 2019-2021

Volunteer, Integration Bee, University of Pittsburgh March 2019

Huazhong Agricultural University

Team Leader, Mathematical Modeling Team 2012-2014

Leader for Class 2014, Career Planning Elite Training Camp 2011-2014

Team Leader and Volunteer, Voluntary Teaching Organization 2011-2012

Industrial and Commercial Bank of China

Internship Assistant Summer 2013

PROFESSIONAL AFFILIATIONS

- Women in Numerical Analysis and Scientific Computing (WINASc) July 2022 – Present
- Society for Industrial and Applied Mathematics (SIAM) August 2016 – Present

SKILLS

Programming Languages: C++, Python, L^AT_EX

Mathematical Software: Freefem++, FEniCS, MATLAB, R, GAUSS, EViews, SAS, LINGO

Communication: English (fluent), Chinese (native), Korean (elementary)

Other: strong leadership, project management and problem solving skills