Xingri Geng

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Education

National University of Singapore — Singapore
Ph.D. in Mathematics, Advisor: Prof. Weizhu Bao and Prof. Xuefeng Wang — Aug 2018 –Jan 2024

Southern University of Science and Technology — Shenzhen, China
B.S. in Mathematics, Advisor: Prof. Xuefeng Wang — Aug 2014 –Jul 2018

Skills

- **Technical skills:** Python, C/C++ (Basic), Java (Basic), Shell, MATLAB, FreeFEM++, Julia, Latex
- **Tools:** Pytorch, Numpy, Pandas, Matplotlib, Sklearn, Git

Research Interest

- Partial Differential Equations and Their Applications

  My main interest here lies in the study of reaction-diffusion equations on domains with thin layers arising from diverse fields such as material science, biology, and ecology. To reveal the effects of these layers, "*effective boundary conditions*" (EBCs) are imposed by the limit of solutions of the original problem as the thickness of the layer decreases to zero.

- Numerical Methods for Systems of Coupled Bulk-surface PDEs

  The Bulk-Surface Finite Element Method (BSFEM) is employed to address coupled bulk-surface partial differential equations (BSPDEs) originating from diverse fields, including cellular biological systems, fluid dynamics, and plant biology.

- Neutral Networks for Partial Differential Equations

  Neutral Galerkin schemes is utilized for solving reaction-diffusion equations through deep learning to proficiently obtain numerical solutions, wherein training data samples were generated using active learning techniques.

Scholarships and Awards

- Best paper award of Bachelor in **SUSTech**, Shenzhen, China — Jul 2018
- Selected as secondary excelent student in **SUSTech**, Shenzhen, China — Aug 2015 –Aug 2017
- Government Scholarship in Southern University of Science and Technology, Shenzhen, China — Aug 2014 –Aug 2018

Publications

1. **X. Geng** and Y. Wang, *Fractional Laplacian boundary condition as a singular limit of problems degenerating at the boundary, with Yantao Wang*, in preparation.
2. **X. Geng** and Y. Wang, *Effective interface arising from wave equation*, in preparation.
3. **X. Geng** and H. Huang, *Asymptotic spreading of competition diffusion systems with an effective boundary condition on a road*, in preparation.
4. **X. Geng**, *Effective boundary conditions for the Fisher-KPP equation with 3-dimensional optimally aligned coatings*, preprint, 2024.

5. **X. Geng**, *Effective boundary conditions for heat equation arising from anisotropic and optimally aligned coatings in three dimensions*, under review, 2023.

6. **X. Geng**, *Effective boundary conditions arising from the heat equation with three-dimensional interior inclusion*, Commum. Pure Appl. Anal. 2022.

Conferences and Talks

- 2023 Winter Conference on Partial Differential Equations, Nankai University, Tianjin, China Dec 1 - 3, 2023
  - *Title: Effective Boundary Conditions for 3-dimensional Optimally Aligned Coatings*
- 2022 SciCADE, University of Iceland, Reykjavik, Iceland Jul 24 - 29, 2022
  - *Title: Effective Boundary Conditions for the Heat Equation with Three-dimensional Anisotropic and Optimally Aligned Coatings*
- PDE and Scientific Computing Seminar, University of Singapore, Singapore Nov 2, 2019
  - *Title: The method of moving planes and sliding domains*

Teaching Experience

- Spring 2021 Ordinary Differential Equations (**TA**)
- Spring 2020 Ordinary Differential Equations (**TA**)
- Spring 2019 Math Clinic(**TA**)
- Fall 2018 Linear Algebra and Mathematical Analysis (**TA**)

Interests

- **Swimming**
- **Running**
- **Boxing**
- **Tennis**

Languages

- **Chinese:** Native
- **English:** Fluent
- **German:** Basic
- **Japanese:** Basic