Jingfeng Wang

+1-984-382-6317 | jwang284@ncsu.edu | shankswang953@gmail.com

Personal Website | Official Website

Raleigh, NC - 27606, U.S.

Education

Ph.D., Department of Mathematics, University of Macau (supervised by Prof. Guanghui Hu) 2020–2024
B.Sc., College of Mathematics, Sichuan University, *with honorary degree* 2016–2020

Work Experience

Postdoctoral Research Scholar
Department of Mathematics, North Carolina State University (supervised by Prof. Zixuan Cang) 2024–Present

Research Interests

My primary research interests lie in the areas of **Partial Differential Equations**, **Optimal Transport**, and **Machine Learning**. I focus on exploring how these mathematical and computational tools can be applied to diverse optimization problems across different scientific domains. In particular, my work involves **aerodynamic shape optimization in computational fluid dynamics** and **biological data analysis**, such as **trajectory inference in gene expression** and **property prediction of protein structures**. Through these projects, I aim to build efficient, interpretable, and theoretically grounded models that connect rigorous mathematics with real-world applications.

Keyword: Numerical PDEs, Mesh adaptation, Machine learning, Reinforcement learning, Optimal Transport.

Publications

*** corresponding author**

- **Jingfeng Wang**, Guanghui Hu(2025) **A Neural-network based converging input with DWR-based mesh adaptation method for efficient quantity of interest calculation,** *preprint*.
- Perry Beamer, Tanner Byer, Zixuan Cang*,**Jingfeng Wang*** (2025) **Protein-Ligand Affinity Prediction via Topologically-Aware Graph Neural Network**, *preprint*. *(Authors listed in alphabetical order)*
- **Jingfeng Wang**, Yanxiang Zhao, Zixuan Cang (2025). **Synchronized optimal transport for cross-modality trajectory inference integrating scRNA-seq and scATAC-seq**, *preprint*.

[6] Yaqi Wu, **Jingfeng Wang**, Xin Maizie Zhou, Yanxiang Zhao, Zixuan Cang (2025). **RAFT-UP: robust alignment for spatial transcriptomics under partial-overlapping**, Under review.

[5] Zixuan Cang, **Jingfeng Wang**, Xiaoqi Wei, Yanxiang Zhao (2026). **Synchronization of Unbalanced Dynamical Optimal Transport across Multiple Spaces**, Under review. *(Authors listed in alphabetical order)*

[4] **Jingfeng Wang**, Guanghui Hu (2025). **A mechanism-driven reinforcement learning framework for shape optimization of airfoils**, Under revision by Communications in Computational Physics.

[3] Guanghui Hu, Ruo Li, **Jingfeng Wang*** (2025). **A multi-mesh approach for accurate computation of multi-target functionals in aerodynamics design**, Journal of Computational Physics, 535:114054.

[2] **Jingfeng Wang**, Guanghui Hu (2024). **Towards the efficient calculation of quantity of interest from steady Euler equations II: a CNNs-based automatic implementation**, Communications in Computational Physics, 39(3):884 – 918.

[1] **Jingfeng Wang**, Guanghui Hu (2023). **Towards the efficient calculation of quantity of interest from steady Euler equations I: A dual-consistent DWR-based h-adaptive Newton-GMG solver**, Communications in Computational Physics, 35(3):579–608.

Conferences and Talks

- **Synchronized Optimal Transport for Trajectory Inference in Biological Systems**
  SIAM Central States Section Annual Meeting 2025, University of Arkansas, October 2025, U.S.A.
- **Synchronized Optimal Transport for Trajectory Inference in Biological Systems**
  2025 SIAM New York–New Jersey–Pennsylvania Section Conference, Pennsylvania State University, November 2025, U.S.A.
- **A Reinforcement Learning Framework for Shape Optimal Design of Airfoils Based on the Steady Euler Equations**
  Applied Math Seminar at George Washington University, George Washington University (Virtual), September 27, 2024, Online talk.

- **Towards the calculation of generalized target functional with multi-mesh approach**
  International Conference on Scientific Computation and Differential Equations (SciCADE 2024), National University of Singapore, August 15, 2024, Singapore.
- **A mechanism-driven reinforcement learning framework for shape optimization of airfoils**
  The 17th SIAM East Asian Section Conference, University of Macau, June 30, 2024, Macao S.A.R., P.R. China.
- **Towards the fusion of mechanism and machine learning for shape optimal design of airfoil**
  The 3rd Guangdong–Hong Kong–Macao Conference on Computational Science, Shantou, Guangdong Province, June 15, 2024, P.R. China.
- **A hybrid CNNs–Dual approach for DWR-based mesh adaptation for solving steady Euler equations**
  The 21st Annual Meeting of the Chinese Society of Industrial and Applied Mathematics, Yunnan Haigeng Hall, October 14, 2023, Kunming, Jiangsu Province, P.R. China.
- **Towards automatic highly efficient DWR-based h-adaptive method in Newton–GMG framework for steady Euler equations**
  HKUST SIAM Student Chapter Annual Meeting, The Hong Kong University of Science and Technology, June 05, 2023, Hong Kong S.A.R., P.R. China.
- **On towards dual consistency of a DWR-based h-adaptive Newton–GMG framework for steady Euler equations**
  The 20th Symposium on Numerical Methods of Fluid Mechanics, Golden Eagle Shangmei Hotel, April 02, 2023, Nanjing, Jiangsu Province, P.R. China.

Conference Organization

- **Co-organizer**, Mini Symposium: *Optimal Transport in Biological Sciences*
  2025 SIAM New York–New Jersey–Pennsylvania Section Conference, Pennsylvania State University, November 2025, U.S.A.

Teaching Experience

- **North Carolina State University** *Aug 2024 - now*
  Instructor North Carolina, U.S.
  - MAT 131 - 002: Calculus for Life and Management Sciences A, 2025 Fall.
  - MAT 131 - 003: Calculus for Life and Management Sciences A, 2025 Fall.
  - MAT 241 - 004: Calculus II, 2025 Spring.
  - MAT 241 - 005: Calculus II, 2025 Spring.
- **University of Macau** *Aug 2020 - Jul 2024*
  Tutorial Class Macao S.A.R., China
  - MATH - 2003: Mathematical Analysis I, 2020 Fall.
  - MATH - 2004: Mathematical Analysis II, 2021 Spring.
  - MATH - 4000: Elementary Number Theory, 2021 Fall, 2022 Fall, 2023 Fall.
  - CISC - 1006: Probability and Statistics , 2022 Spring, 2023 Spring.
  - MATH - 1003: Intermediate Calculus, 2024 Spring.

Awards

- 2025 : **Travel Award**, SIAM Central States Section Annual Meeting 2025
- 2022 : **Best Poster Award at workshop "A Math Day in the Greater Bay Area 2022"**, with the poster entitled *Dual consistency in DWR-based mesh adaptation for Euler equations*, University of Macau.
- 2020 : **Honours degree**, Sichuan University.
- 2019 : **Outstanding Graduate Cadre**, Sichuan University.