Jingtao Wang
Ph.D. Candidate at McGill University
Email: jingtao.wang@mail.mcgill.ca
GitHub: https://github.com/JingtaoWang22

RESEARCH INTEREST

My research focuses on developing AI methods, such as deep generative models, to analyze and generate complex biological data, particularly single-cell omics. By advancing computational strategies for data interpretation and simulation, I aim to contribute to a deeper understanding of cellular behavior and biological mechanisms, with potential applications in aging, disease research, and therapeutic development.

EDUCATION

Degree Programs:

McGill University, Montreal, Canada **GPA: 4.00/4.00**
Doctor of Philosophy, Experimental Medicine, September 2021 - Present
Supervisors: Dr. Jun Ding and Dr. Gregory Fonseca
Selected Coursework: Reinforcement Learning   Molecular Meths in Medical Research

Carnegie Mellon University, Pittsburgh, USA **GPA: 3.93/4.33**
Master of Science, Automated Science, August 2019 - June 2021
Selected Coursework: Fundamentals of Bioinformatics   Applied Cell and Molecular Biology
         Machine Learning for Scientists   Automated Laboratory Methods I&II

Harbin Institute of Technology, Harbin, China **Major GPA: 85.10/100**
Bachelor of Engineering, Computer Science and Technology, September 2014 - June 2018
Selected Coursework: Operation Research and Optimization   The Design and Analysis of Algorithms
         Data Structures and Algorithms   Design and Practice of Software I&II

Visiting Studies:

Columbia University, New York, NY, USA **GPA: 3.67/4.33**
Harbin Institute of Technology visiting student program, August-December 2016
Selected Coursework: Computer Science Theory, Statistical Machine Learning

National University of Singapore, Singapore **GPA: A+**
Harbin Institute of Technology visiting student program, July-August 2016
Selected Coursework: Biometrics in Depth

TOP CONFERENCE PRESENTATIONS

- *Research in Computational Molecular Biology Satellite Conference (RECOMB-CSB)* — **Oral Presentation**
  "scCross: A Deep Generative Model for Unifying Single-Cell Multi-Omics with Seamless Integration, Cross-Modal Generation, and In Silico Exploration", Seoul, April 26-29, 2025

- *Research in Computational Molecular Biology (RECOMB)* — **Poster Presentation & Lightning Talk**
  "RAMEN Efficiently Unveils Clinical Variable Networks for Complex Diseases Using Absorbing Random Walks and Genetic Algorithms", Seoul, April 26-29, 2025

- *Intelligent Systems for Molecular Biology (ISMB)* — **Oral Presentation**
  "Enabling Affordable Single-Cell Data in Large Cohort Studies via Deep Generative Neural Networks and Active Learning", Montreal, July 20-24, 2024

GRANTS & FUNDING

Digital Research Alliance of Canada – Resources for Research Groups (RRG) Grant
Project: Decoding Cellular Dynamics in Complex Diseases with Deep Generative AI for In-Silico Therapeutics
Role: Co-contributor **PI:** Dr. Jun Ding | **Awarded Resources:** 200 core-years (CPU), 64 RGU-years (GPU), 200 TB storage **Total Value:** ~$111,460 CAD | **Status:** Awarded, Active (July 2025 – April 2026)

PUBLICATIONS

Published Work (†: Co-first authors)

Wang, Jingtao , Gregory J. Fonseca, and Jun Ding. *"scSemiProfiler: Advancing large-scale single-cell studies through semi-profiling with deep generative models and active learning." Nature communications* 15.1 (2024): 5989.
- **Highlighted by the editors as a Top 50 paper in the field**
- **Featured in *Nature*: Technology Feature Link**

Xiong, Yiwei[†], **Jingtao Wang**[†], Xiaoxiao Shang, Tingting Chen, Douglas D. Fraser, Gregory Fonseca, Simon Rousseau, and Jun Ding. *"Efficient and scalable construction of clinical variable networks for complex diseases with RAMEN." Cell Reports Methods,* Accepted, 2025.

Song, Qi, **Jingtao Wang**, and Ziv Bar-Joseph. *"scSTEM: clustering pseudotime ordered single-cell data." Genome Biology* 23.1 (2022): 150.

Hasanaj, Euxhen, **Jingtao Wang**, Arjun Sarathi, Jun Ding, and Ziv Bar-Joseph. *"Interactive single-cell data analysis using Cellar." Nature communications* 13.1 (2022): 1998.

Pang, Steph A., Manuel Flores Molina, Pamela Thébault, Yuming Zheng, Hsiang Chou, Christophe Goncalves, **Jingtao Wang.,** et al. *"Molecular predictors and mechanisms of immune checkpoint inhibitor-induced myocarditis: A case-control study with translational correlates." Journal of Clinical Oncology* 42, no. 16_suppl (2024): 12031-12031.

Accepted Publication
Wagner, D.E., Alsafadi, H.N., Mitash, N., ... **Wang, J.**, Sembrat, J., Hilgendorff, A., Ding, J**.**, Günther, A., et al. *"Inhibition of epithelial cell YAP-TEAD/LOX signaling attenuates pulmonary fibrosis." Nature Communications*, 2025.

Preprints
Pumeng, Shi[†], **Jingtao Wang**[†], Hijazin Michel[†], and Jun Ding. *"DTPSP: A Deep Learning Framework for Optimized Time Point Selection in Time-Series Single-Cell Studies." bioRxiv* (2024): 2024-12.

Tai, Huilin [†], Qian Li [†], **Jingtao Wang** [†], Jiahui Tan, Ryann Lang, Basil J. Petrof, and Jun Ding. *"CellSexID: Sex-Based Computational Tracking of Cellular Origins in Chimeric Models." bioRxiv* (2024): 2024-12.
(Under revision at *Cell Reports Methods*)

Papers to be Submitted
Wang, Jingtao[†], Pumeng Shi[†], Nicole Heimbach, David Eidelman, and Jun Ding. *"Universally Enhancing Deep Learning Models by Injecting Human Knowledge Through Task-Driven Reverse Probing."*
Wang, Jingtao, Sinian Zhang, and Jun Ding. *"Transforming Deep Learning with Genetic Algorithms: A Comprehensive Framework for Enhancing Structure Learning, Optimization, and Backpropagation Surrogates."*

HONORS

2025 RI-MUHC Studentship and Fellowship Competition, Ph.D.
Top 50 Best Papers in *Nature Communications* Editors' Highlights (Biotechnology and Methods Category), 2024
MEAKINS-CHRISTIE LABORATORIES 2022-2023 COLLABORATIVE RESEARCH AWARD
MEAKINS-CHRISTIE LABORATORIES 2021-2022 COLLABORATIVE RESEARCH AWARD
Harbin Institute of Technology Second-class Scholarship, 2017

OTHER PRESENTATION & TEACHING

BIRS–IASM Spatial Omics Workshop **Flash Talk**, *June* 2025
Meakins Genomics Workshop **Teaching Assistant**, *Aug 2022 and Aug 2024*
RI-MUHC Respiratory Research Day **Oral Presentation**, *Apr 2024*
RI-MUHC Respiratory Research Day **Poster Presentation**, *Jun 2023*

RESEARCH CONTRIBUTIONS & COLLABORATIONS

Nature Communications Paper Review (2025, 2024)
Journal of Nanobiotechnology Paper Review (2025)
Scientific Reports Paper Review (2025)
BMC Genomics Paper Review (2025)
Computational and Structural Biotechnology Paper Review (2025)
PLOS Computational Biology Paper Review (2025)
Genome Medicine Paper Review (2025)
SickKids Myocarditis Single-Cell Data Analysis (2024)
Biobanque québécoise de la COVID-19 (BQC-19) Patient Data Analysis (2021)

OTHER RESEARCH EXPERIENCES

Capstone Project, Carnegie Mellon University (*Sep 2020 – Dec 2020*)
  Automated HeLa cell line staining, imaging, and passage using robotic labware. Conducted comparative analysis of manual versus robotic performance in these operations.