# Boyi Hu

## CONTACT INFORMATION


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## RESEARCH INTERESTS

Machine learning, high-dimensional multi-omics data integration, functional data analysis, semi-parametric inference, empirical likelihood

## TRAINING & EDUCATION

**Postdoctoral Research Scientist in Biostatistics** 11/2023 - PRESENT
COLUMBIA UNIVERSITY IRVING MEDICAL CENTER
*New York, NY 10032, USA*

- Advisors: Professor Yuanjia Wang and Professor Annie J. Lee

**Ph.D. in Statistics** 09/2018 - 08/2023
SIMON FRASER UNIVERSITY
*Burnaby, British Columbia, Canada*

- Supervisor: Professor Jiguo Cao
- Thesis: Functional regression models

**M.Sc. in Statistics** 09/2016 - 08/2018
UNIVERSITY OF BRITISH COLUMBIA
*Vancouver, British Columbia, Canada*

- Supervisor: Professor Jiahua Chen
- Thesis: An R package for monitoring test under density ratio model and its applications

**M.Sc. in Mathematical Science** 09/2014 - 06/2016
LAKEHEAD UNIVERSITY
*Thunder Bay, Ontario, Canada*

- Supervisor: Professor Deli Li

**B.Sc. in Applied Mathematics** 09/2009 - 06/2013
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA
*Hefei, Anhui, China*

## HONORS & AWARDS

| | |
|---|---|
| Finalist, ARISE (Aging Research – Innovations in Statistical Exploration) program organized by the ASA (American Statistical Association) Statistics and Data Science in Aging Interest Group | 2025 |
| Alzheimer's Association International Conference 2025 (AAIC) Fellowship | 2025 |
| Finalist, Poster competition, *14th Annual Taub Institute Research Retreat* | 2024 |
| Simon Fraser University Graduate Fellowship | 2022 - 2023 |
| Mitacs Accelerate Fellowship | 2020 - 2021 |
| Simon Fraser University Big Data Graduate Scholarships | 2019 |
| University of British Columbia International Tuition Award | 2016 |

## PUBLICATIONS & PREPRINTS

***A. Original, peer-reviewed articles (In chronological order)***

**Statistical Methodology Publications**:

1. **Hu, B.**, Hu, X., Liu, H., You, J., & Cao, J. (2024). Simultaneous functional quantile regression. *Statistica Sinica*, 34(2).

2. **Hu, B.**, & Cao, J. (2024). Locally sparse estimation for simultaneous functional quantile regression. Revision invited by *Journal of Computational and Graphical Statistics*; resubmitted.

3. **Hu, B.**, Liu, H., You, J., & Cao, J. (2024). Convolution smoothing–based locally sparse estimation for functional quantile regression. Revision invited by *Journal of Agricultural, Biological, and Environmental Statistics*; resubmitted.

4. Zhuang, W., **Hu, B.**, & Chen, J. (2019). Semiparametric inference for the dominance index under the density ratio model. *Biometrika*, 106(1), 229–241.

***B. Preprints***

**Substantive Area Publications**:

1. **Hu, B.**, Vardarajan, B., De Jager, P. L., Bennett, D., Wang, Y., & Lee, A. (2025). TPClust: Temporal profile–guided disease subtyping using high-dimensional omics data. *bioRxiv*. https://doi.org/10.1101/2025.08.05.668514. (Submitted to *Nature Communications*.)

***C. Working papers***

1. **Boyi Hu**, Yuanjia Wang and Annie J. Lee (2025). MV-TPClust: Multivariate Temporal Profile–Guided Clustering with High-dimensional Multi-omics Data.

2. **Boyi Hu**, Jinfeng Lu, David A. Bennett, Annie J. Lee and Badri N. Vardarajan (2025). Novel Short Tandem Repeats on the Telomere-to-Telomere Reference Genome are Associated with Alzheimer's Disease Neuropathology.

***D. Posters***

1. "TPClust: Temporal Profile-Guided Disease Subtyping Using High-Dimensional Omics Data". *2025 Joint Statistical Meetings (JSM)*, Nashville, Tennessee, USA, 08/2025.

2. "TPClust: Temporal Profile-Guided Disease Subtyping Using High-Dimensional Omics Data". *Alzheimer's Association International Conference (AAIC) 2025*, Toronto, Ontario, Canada, 07/2025.

3. "Alzheimer's Disease Subtyping Using Longitudinal Clinical Data and Brain Transcriptome". *14th Annual Taub Institute Research Retreat*, New York, NY, USA, 09/2024.

4. "A Semi-Parametric Approach for Longitudinal Outcome-Guided Disease Subtyping Using High-Dimensional Omics Data". *2024 Columbia University Postdoctoral Research Symposium*, New York, NY, USA, 05/2024.

5. "Uncertainty Quantification of Weather Forecasts". Joint work with: Ho Yin Ho, Yu Wang and Archer Zhang. *Case Study Poster Session at 2018 Joint Statistical Meeting (JSM)*, Vancouver, BC, Canada, 07/2018.

## TALKS & PRESENTATIONS

***Invited Talks***:

- Invited talk at **ARISE (Aging Research – Innovations in Statistical Exploration) Fall 2025 Webinar Series**: Temporal Profile-Guided Subtyping Using High-Dimensional Omics Data. 09/2025
- Invited talk at **2025 Lifetime Data Science (LiDS) Conference**: Novel Machine Learning Method Identifies Alzheimer's Disease Subtypes Using Longitudinal Clinical Data and High-dimensional Omics Data. 05/2025
- Invited seminar talk at **Department of Mathematics and Statistics, York University**: Functional Regression Models. (remote via Zoom) 10/2023
- Invited seminar talk at **School of Mathematics and Statistics, Carleton University**: Functional Quantile Regression. 04/2023
- **International Workshop on Complex Functional Data Analysis**: Simultaneous Functional Quantile Regression.(remote via Zoom) 06/2022

*Contributed Talks*:

- **2025 International Conference on Alzheimer's and Parkinson's Diseases and Related Neurological Disorders (AD/PD)**: Novel Machine Learning Method Identified Alzheimer's Disease Subtypes Using Longitudinal Clinical Data and High-dimensional Omics Data. (Virtual) 04/2025
- **2024 Joint Statistical Meetings (JSM)**: A Semi-Parametric Approach for Longitudinal Outcome-Guided Disease Subtyping Using High-Dimensional Omics Data. 08/2024
- **2023 Statistical Society of Canada (SSC) Annual Meeting**: Simultaneous Functional Quantile Regression. 05/2023
- **2022 Statistical Society of Canada (SSC) Annual Meeting**: Convolution Smoothed Semi-parametric Quantile Functional Linear Regressions with Locally Sparse Adaptation. 06/2022
- **2021 Canadian Statistical Sciences Institute (CANSSI) Showcase**: Simultaneous Functional Quantile Regression. 11/2021

## MENTORING & TEACHING EXPERIENCE

**Mentoring Experience for Master's Students' Practicum**
*Masters' students, Department of Biostatistics, Columbia University*

- Yaduo Wang 09/2024 - 05/2025
- Xuesen Zhao 01/2024 - 05/2024
- Zuoqiao Cui 01/2024 - 05/2024
- Zhengwei Song 01/2024 - 05/2024

**Guest Lecturer, Columbia University**

- BIST P9186-Statistical Practice and Research for Interdisciplinary Sciences (SPRIS) 04/2025
- BIST P9186-Statistical Practice and Research for Interdisciplinary Sciences (SPRIS) 04/2024

**Teaching Assistant, Simon Fraser University**
*Held weekly labs and office hours, created and marked assignments and exams, delivered lectures in place of the instructor during their absence*

- STAT 380-Intro to Stochastic Process 01/2022 - 04/2022
- STAT 330-Introduction to Mathematical Statistics 09/2021 - 12/2021
- STAT 831-Statistical Theory 01/2020 - 04/2020
- Statistics Workshop 09/2019 - 12/2019
- Statistics Workshop 05/2019 - 08/2019
- STAT 380-Intro to Stochastic Process 01/2019 - 04/2019
- Statistics Workshop 09/2018 - 12/2018

**Teaching Assistant, University of British Columbia**
*Held weekly labs and office hours, marked assignments and exams*

- STAT 344-Sample Surveys 09/2017 - 12/2017
- STAT 251-Introductory Probability and Statistics 01/2017 - 04/2017
- STAT 300-Intermediate Statistics for Applications 09/2016 - 12/2016

## PROFESSIONAL EXPERIENCE

**Mitacs Accelerate Internship** 11/2020 - 06/2021
SIMON FRASER UNIVERSITY
*Burnaby, British Columbia, Canada*

- Developed a machine learning-based wine recommendation engine for Quini, a startup company, as part of the Mitacs Accelerate program

- Advisor: Professor Jiguo Cao

## PROFESSIONAL ACTIVITIES

***Poster Judge***

- 2024 Columbia University Postdoctoral Research Symposium

***Reviewer***

- Biometrics
- Statistics in Medicine
- Journal of Agricultural, Biological, and Environmental Statistics
- Stat

***Volunteer***

- Volunteer at 2018 Joint Statistical Meetings (JSM), Vancouver, British Columbia, Canada
- Volunteer at International Chinese Statistical Association (ICSA)-Canada Chapter 2017 Symposium, Vancouver, British Columbia, Canada