

# Boyi Hu

## CONTACT INFORMATION

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## RESEARCH INTERESTS

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

## TRAINING & EDUCATION

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<b>Postdoctoral Research Scientist in Biostatistics</b> COLUMBIA UNIVERSITY IRVING MEDICAL CENTER <i>New York, NY 10032, USA</i>	11/2023 - PRESENT
• Advisors: Professor Yuanjia Wang and Professor Annie J. Lee	
<b>Ph.D. in Statistics</b> SIMON FRASER UNIVERSITY <i>Burnaby, British Columbia, Canada</i>	09/2018 - 08/2023
• Supervisor: Professor Jiguo Cao • Thesis: Functional regression models	
<b>M.Sc. in Statistics</b> UNIVERSITY OF BRITISH COLUMBIA <i>Vancouver, British Columbia, Canada</i>	09/2016 - 08/2018
• Supervisor: Professor Jiahua Chen • Thesis: An R package for monitoring test under density ratio model and its applications	
<b>M.Sc. in Mathematical Science</b> LAKEHEAD UNIVERSITY <i>Thunder Bay, Ontario, Canada</i>	09/2014 - 06/2016
• Supervisor: Professor Deli Li	
<b>B.Sc. in Applied Mathematics</b> UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA <i>Hefei, Anhui, China</i>	09/2009 - 06/2013
<b>HONORS &amp; AWARDS</b>	
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

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### 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. Conference Abstracts

1. **Hu, B.**, Vardarajan, B., De Jager, P. L., Bennett, D., Wang, Y., & Lee, A. *TPCLust: Temporal Profile-Guided Disease Subtyping Using High-Dimensional Omics Data*. Poster, Alzheimer's Association International Conference (AAIC) 2025, Toronto, Canada. Program link: <https://alz.confex.com/alz/2025/meetingapp.cgi/Paper/103996>.

## TALKS & PRESENTATIONS

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#### 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

**Posters:**

- **2025 Joint Statistical Meetings (JSM):** TPClust: Temporal Profile-Guided Disease Subtyping Using High-Dimensional Omics Data. 08/2025
- **14th Annual Taub Institute Research Retreat:** Alzheimer's Disease Subtyping Using Longitudinal Clinical Data and Brain Transcriptome. 09/2024
- **2024 Columbia University Postdoctoral Research Symposium:** A Semi-Parametric Approach for Longitudinal Outcome-Guided Disease Subtyping Using High-Dimensional Omics Data. 05/2024
- **Case Study Poster Session at 2018 Joint Statistical Meeting (JSM):** Uncertainty Quantification of Weather Forecasts. 07/2018

## MENTORING & TEACHING EXPERIENCE

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**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**

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### **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**

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### ***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