

# Boyi Hu

## CONTACT INFORMATION

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Homepage: <https://boyihu673.github.io>

## 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

## HONORS & AWARDS

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• <b>Finalist</b> , ARISE (Aging Research – Innovations in Statistical Exploration) Program, ASA Statistics and Data Science in Aging Interest Group	2025
• <b>AAIC Fellowship</b> , Alzheimer's Association International Conference (AAIC)	2025
• <b>Finalist</b> , Poster Competition, 14th Annual Taub Institute Research Retreat (Columbia University)	2024
• <b>Graduate Fellowship</b> , Simon Fraser University	Summer 2023
• <b>Graduate Fellowship</b> , Simon Fraser University	Spring 2023
• <b>Graduate Fellowship</b> , Simon Fraser University	Summer 2022
• <b>Graduate Fellowship</b> , Simon Fraser University	Summer 2020
• <b>Big Data Graduate Scholarship</b> , Simon Fraser University	Fall 2019
• <b>Graduate Fellowship</b> , Simon Fraser University	Summer 2019

- **Mitacs Accelerate Fellowship** 2020–2021
- **International Tuition Award**, University of British Columbia 2016

## PUBLICATIONS & PREPRINTS

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

- **Hu, B.**, & Cao, J. (2026). Locally sparse estimation for simultaneous functional quantile regression. *Journal of Computational and Graphical Statistics* (In press). arXiv. <https://arxiv.org/abs/2602.01691>
- **Hu, B.**, Liu, H., You, J., & Cao, J. (2026). Convolution smoothing-based locally sparse estimation for functional quantile regression. *Journal of Agricultural, Biological, and Environmental Statistics* (In press). arXiv. <https://arxiv.org/abs/2512.01341>
- **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*. Under review. bioRxiv. <https://doi.org/10.1101/2025.08.05.668514>.
- Touil, H., Luquez, T., Comandante-Lou, N., Lee, A. J., Fujita, M., Habeck, C., Kroshilina, A., Hegewisch-Solloa, E., Pedroza, L. A., McInvale, J., Zuroff, L., Isnard, S., Majumder, B., Walker, E., Zhang, L., Das, A., Routy, J.-P., **Hu, B.**, Zhang, Y., Reyes-Dumeyer, D., Mace, E. M., Klotz, L., Wiendl, H., Orange, J., Xia, Z., Bar-Or, A., Menon, V., Mayeux, R., Stern, Y., & De Jager, P. L. (2025). *Trajectories of immunosenescence highlight age-associated accumulation of PD-L1<sup>+</sup> NK cells and association with brain atrophy*. Under review.
- **Hu, B.**, Hu, X., Liu, H., You, J., & Cao, J. (2024). Simultaneous functional quantile regression. *Statistica Sinica*, 34(2).
- Zhuang, W., **Hu, B.**, & Chen, J. (2019). Semiparametric inference for the dominance index under the density ratio model. *Biometrika*, 106(1), 229–241.

### B. Conference Abstracts

- **Hu, B.<sup>1</sup>**, Vardarajan, B.<sup>1</sup>, De Jager, P. L.<sup>1</sup>, Bennett, D.<sup>1</sup>, Wang, Y.<sup>1</sup>, & Lee, A.<sup>1</sup>. *TPClust: Temporal Profile–Guided Disease Subtyping Using High-Dimensional Omics Data*. Alzheimer's Association International Conference (AAIC) 2025, Toronto, Canada. <https://alz.confex.com/alz/2025/meetingapp.cgi/Paper/103996>.
- <sup>1</sup>Columbia University, New York, NY.
- Lee, A.<sup>1</sup>, **Hu, B.<sup>1</sup>**, Lu, J.<sup>1</sup>, Bennett, D.<sup>2</sup>, & Vardarajan, B.<sup>1</sup>. *Novel short tandem repeats on the telomere-to-telomere reference genome are associated with Alzheimer's disease neuropathology*. American Society of Human Genetics (ASHG) 2024, Denver, Colorado. <https://www.ashg.org/wp-content/uploads/2024/10/ASHG2024-PlatformAbstracts.pdf>.
- <sup>1</sup>Columbia University, New York, NY; <sup>2</sup>Rush University Medical Center, Chicago, IL.

### C. Manuscripts in preparation

- Boyi Hu, Yuanjia Wang and Annie J. Lee (2026). MV-TPClust: Multivariate Temporal Profile–Guided Clustering with High-dimensional Multi-omics Data.
- Annie J. Lee, **Boyi Hu**, Jinfeng Lu, David A. Bennett and Badri N. Vardarajan (2026). Novel Short Tandem Repeats on the Telomere-to-Telomere Reference Genome are Associated with Alzheimer's Disease Neuropathology.

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

- Seminar Series: Statistical and Computational Methods in Neurodegenerative Disease Research 11/2025
- 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**

*Delivered tutorial lectures; led weekly labs and office hours; prepared and graded assignments and exams.*

- 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](#).

## PROFESSIONAL ACTIVITIES AND SERVICE

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### *Journal Reviewer*

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

### *Poster Judge*

- 2024 Columbia University Postdoctoral Research Symposium

### *Grant Writing Training*

- Writing Specific Aims Workshop, Columbia University
- K Award Program for On-Time Proposal Preparation, Columbia University

### *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