Boyi Hu

CONTACT INFORMATION

Address:	Columbia University Irving Medical Center, 622 West 168th Street, New York, NY 10032, USA
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Homepage:	https://boyihu673.github.io

RESEARCH INTERESTS

Machine learning, large-scale multi-omics data, precision medicine, functional data analysis, semi-parametric models, empirical likelihood

TRAINING & EDUCATION

Postdoctoral Research Scientist in Biostatistics   10/2023 - 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. **Boyi Hu** and Jiguo Cao (2024). "Locally Sparse Estimation for Simultaneous Functional Quantile Regression". Revision invited by *Journal of Computational and Graphical Statistics*, resubmitted.

2. **Boyi Hu**, Hua Liu, Jinhong You and Jiguo Cao (2024). "Convolution Smoothing based Locally Sparse Estimation for Functional Quantile Regression". Revision invited by *Journal of Agricultural, Biological, and Environmental Statistics*, resubmitted.

3. **Boyi Hu**, Xixi Hu, Hua Liu, Jinhong You and Jiguo Cao (2022). "Simultaneous Functional Quantile Regression". *Statistica Sinica*, 34(2). doi:https://doi.org/10.5705/ss.202021.0248

4. Weiwei Zhuang, **Boyi Hu** and Jiahua Chen (2019). "Semiparametric Inference for the Dominance Index under the Density Ratio Model". *Biometrika*. 106(1), 229-241.

B. Preprints

Substantive Area Publications:

1. **Boyi Hu**, Badri N. Vardarajan, Philip L. De Jager, David A. Bennett, Yuanjia Wang and Annie J. Lee (2025). TPClust: Temporal Profile-Guided Disease Subtyping Using High-Dimensional Omics Data. Submitted to *Nature Computational Science*. https://www.biorxiv.org/content/early/2025/08/07/2025.08.05.668514

C. Working papers

1. **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.

2. **Boyi Hu**, and Jiahua Chen (2025). Non-Parametric and Data-Driven Basis Function Estimation Under the Density Ratio Model.

3. **Boyi Hu**, and Jiguo Cao (2025). A Semi-Parametric Functional Generalized Linear Model with Density Ratio Structure.

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