Jiangmei (Ruby) Xiong

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Education

Ph.D. Biostatistics   Expected: 2025
Vanderbilt University, Nashville, TN, USA   GPA: 3.95
Dissertation: Statistical Analysis in Modern Medical Image Analysis

M.A. Statistics   2018-2019
Columbia University, New York, NY, USA.   GPA: 3.67
Courses: introductory statistics theory, statistical models

Bachelor of Actuarial Studies   2015-2018
Australian National University, Canberra, ACT, Australia   Grade: Distinction
Courses: quantitative finance, statistics, actuarial study theories

RESEARCH EXPERIENCE

Academic Contractor, Global PK/PD and Pharmacometrics   May 2024 – Aug 2024
Eli Lily and Company, Indianapolis, IN
Project title: "Translation of ADC PK parameters from pre-clinical species to humans"
- Performed literature review and data collection of PK data for Antibody-Drug Conjugate (ADC)
- Analyzed data collected with PK models
- Examined allometric scaling index for ADC across different PK models

Graduate Research Assistant, Department of Biostatistics   Dec 2020-present
Vanderbilt University, Nashville, TN

- Project 1: Semi-automated marker gating for single-cell multiplexed imaging
  Contribute to oncology research by devising a standardized pipeline for a preprocessing step in single-cell multiplexed imaging. This pipeline not only frees technicians countless hours of repetitive work, but also refines data quality for downstream analyses.

  - Adapted the Gamma mixture model to be scalable for large image data sets.
  - Wrote an R package *cfGMM* for the adapted Gamma mixture model (available on Github).
  - Created a pipeline for marker gating, limiting between-technician bias and standard- izing the results
  - Wrote a user-friendly R package *GammaGateR* (available on Github) for the pipeline that can process multiple images and markers at once and provides interactive diagnostic plots for model outcomes.

- Project 2: Medical image synthesis

  - Examines machine learning imputation in the context of statistical inference
  - Evaluate the extent of bias and variation that these methods create in medical image datasets

- Project 3: Write software paper for the R *sleev* package

  - The R package produces valid statistical inference in partially-validated error-prone data, which are prevalent in multi-site study and electronic health records
  - Simulated data imitating an HIV study dataset to demonstrate the package's functionality

- Project 4: Psychiatry data Analysis

  - Collaborated with researcher in psychiatry and behavioral sciences
  - Analyzed retrospective data extracted from clinical records
  - Investigated the treatment effect of electroconvulsive therapy for autism patients

- Project 5: Trust task Analysis
  - Collaborated project with team in cognitive sciences
  - Analyzed patient data on cognitive tests
  - Explored the relationship between cognitive test results and patient prognostic measures

Mentor: Dr. Simon Vandekar

Research Intern, Belsky Lab, Robert N. Butler Columbia Aging Center   2020
Columbia University Mailman School of Public Health, New York

- Conducted research related to development of statistical genetic models for social and health outcomes in aging
- Ran structural equation models with genetic wide association studies data and genomic structural equation modeling, and summarized findings in weekly meetings.

Mentor: Dr. Daniel Belsky

Research Assistant, Computational Epidemiology Lab   2019-2020
Harvard Medical School, Remote

- Project 1: Digital surveillance for monitoring environmental health threats
  - Collected Twitter data during Chennai water crisis 2019
  - Applied LDA topic modeling and sentiment analysis on the data
  - Created new pipeline to adapt the LDA output for research questions
  - Interpreted the analysis result and wrote a manuscript on the analysis
- Project 2: Topic modeling and sentiment analysis
  - Collected Reddit data for dementia caregivers
  - Applied BERTopic model and sentiment analysis
  - Contributed to the manuscript

Mentor: Dr. Yulin Hswen

Professional Skills

Computing Language
R (proficient), Python (familiar)
Technical Report Writing
LaTeX , Markdown
Version Control Git/Github

Awards

Distinguished Teaching Assistant   2023
Department of Biostatistics, Vanderbilt University, Nashville, TN
Awarded annually to one teaching assistant within the graduate program of biostatistics for excellence in teaching and a dedication to peer education
- Elected by students and evaluated by faculty committee

Presentations

GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed   May 2024
Multiplexed Imaging, Invited Presentation
Statistical Methods in Imaging, American Statistical Association Statistics in Imaging Section
Indianapolis, Indiana

Facilitating Valid Statistical Inference in Biomedical Image Synthesis   Aug 2024
Joint Statistical Meeting, American Statistical Association
Portland, Oregon

Image Imputation and Synthesis in Medical Imaging   Sep 2023
Vanderbilt Department of Biostatistics Student Journal Club

Application of closed-form gamma mixture in mxIF cell gating   Mar 2022
Eastern North American Region Spring Meeting, ENAR, Houston, Texas

Service

Conference Session Organized
Recent Advances in Spatial Analysis of Single-cell Imaging   May 2023
Statistical Methods in Imaging, American Statistical Association Statistics in Imaging Section University of Minnesota, Minneapolis

Student Representative, Curriculum Review Committee   2024
Department of Biostatistics, Vanderbilt University, Nashville, TN

- Tabulate and present student course feedback to the committee
- Organize meeting with students, present feedback results and facilitate discussion
- Provide student perspective in the committee meetings

Biostatistics Graduate Student Association
Department of Biostatistics, Vanderbilt University, Nashville, TN
- President   2024
  - Oversaw and coordinate all functions in the club
  - Communicated and work with the department regarding student activities
- Vice President   2023
  - Facilitated discussion in student feedback session with department
  - Organized bi-weekly journal club
  - Organized social events
  - Performed budget planning
- Treasurer   2022
  - Handled reimbursement for all activities
  - Performed budget planning

Columbia Statistics Club, Columbia University, New York, NY
- Vice President   2019
  - Coordinated departments for all events
  - Interviewed and train new members
  - Negotiated funding and event plan with faculty advisor
- Public Relations Department   2019
  - Coordinated joint events with other student organizations
  - Promoted events in departments outside department of statistics
- Social Media Department   2018
  - Created weekly newsletter for students that advertise club events

Teaching

Teaching Assistanceship, Department of Biostatistics Vanderbilt University, Nashville, TN

- Contemporary Statistical Inference   Spring 2024
- Statistical Collaboration in Health Sciences   Fall 2023
- Regression Modeling Strategies   Spring 2023

Publications

Peer-reviewed Publication

Xiong J, Kaur H, Heiser CN, McKinley ET, Roland JT, Coffey RJ, Shrubsole MJ, Wro- bel J, Ma S, Lau KS, Vandekar S. *GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Imaging.* Bioinformatics, Volume 40, Issue 6, June 2024, btae356.

Hswen Y, **Xiong J**, Hurley M, Nguyen T. *Experiences of Alzheimer's disease and related dementia family caregivers on Reddit communities: A topic modeling and sentiment analysis.* Artificial Intelligence in Health 2024, 1(3), 127–135.

Smith JR, Hopkins CE, **Xiong J**, Luccarelli J, Shultz E, Vandekar S. *Use of ECT in Autism Spectrum Disorder and/or Intellectual Disability: a Single Site Retrospective Analysis.* Journal of Autism and Developmental Disorders. 2022 Dec 17:1-20.

Xiong J, Hswen Y, Naslund JA. *Digital Surveillance For Monitoring Environmental Health Threats: A Case Study Capturing Public Opinion From Twitter About The 2019 Chennai Water Crisis.* International Journal of Environmental Research And Public Health. 2020 Jul;17(14):5077.

Manuscripts in Review

Xiong J, Lotspeich SC, Sherrill JB, Amorim G, Shepherd BE, Tao R. *sleev: Semiparamet- ric Likelihood Estimation with Errors in Variables.*

Manuscripts in Preparation

Xiong J, Bao S, Vandekar S, Ma S. *Facilitating Valid Statistical Inference in Biomedical Image Synthesis.*