

# Jiangmei (Ruby) Xiong

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## Education

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### Ph.D. Biostatistics

Vanderbilt University, Nashville, TN, USA

Dissertation: Improvement of Medical Imaging Analysis through Statistics

Advisor: Simon Vandekar, Siyuan Ma

Expected: May 2025

GPA: 3.95

### M.A. Statistics

Columbia University, New York, NY, USA.

Relevant Courses: Introductory Statistics Theory, Statistical Models

2018 - 2019

GPA: 3.67

### Bachelor of Actuarial Studies

Australian National University, Canberra, ACT, Australia

Courses: quantitative finance, statistics, actuarial study theories

2015 - 2018

Grade: Distinction

## Professional Experience

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### Academic Contractor/Intern, Global PK/PD and Pharmacometrics Eli Lilly and Company, Indianapolis, IN

May 2024 - Aug 2024

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)
- Examined allometric scaling index for ADC across different PK models with data collected

### Graduate Research Assistant, Department of Biostatistics Vanderbilt University, Nashville, TN

Dec 2020 - present

Supervisor: Simon Vandekar

- Statistical Methods for multiplexed immunofluorescence imaging: developed tools for semi-automated marker gating and addressing statistical bias in AI-based image synthesis algorithms.
- Image synthesis application for neuroimaging.
- Collaborative research in radiology and psychiatry: Retrospective analyses of ECT for catatonia, and cognitive deficits in frontal temporal lobe dementia.
- Manuscript preparation for the measurement error R package

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

2020

Mentor: Daniel Belsky

- 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.

### Research Assistant, Computational Epidemiology Lab Harvard Medical School, Remote

2019-2020

Mentor: Yulin Hswen

- Digital surveillance for monitoring environmental health threats
- Topic modeling and sentiment analysis for Alzheimer's disease caregiver mental health issues

## Publications

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### Peer-reviewed Publication

**Xiong J**, Kaur H, Heiser CN, McKinley ET, Roland JT, Coffey RJ, Shrubsole MJ, Wrobel 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.

*Featured in National Cancer Institute Center for Biomedical Informatics and Information Technology News Column: "GammaGateR Helps Decipher Imaging Data"*

Kang, K., Seidlitz, J., Bethlehem, R. A., **Xiong, J.**, Jones, M. T., Mehta, K., ... & Vandekar, S. (2024). Study design features increase replicability in brain-wide association studies. *Nature*, 1-9.

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: Semiparametric 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*.

## Awards

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### 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

### Software Packages

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#### GammaGateR

R package for the pipeline that can process multiple images and markers at once and provides interactive diagnostic plots for model outcomes.

#### cfGMM

R package that fits closed-form Gamma mixture model.

## Professional Skills

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### Computing Language

R (proficient), Python (intermediate)

### Technical Report Writing

## Invited Presentations

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<b>GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Multiplexed Imaging, Invited Presentation</b> Cancer Systems Biology Consortium Image Analysis Working Group (virtual presentation)	Oct 2024
<b>GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Multiplexed Imaging, Invited Presentation</b> Emory Network of Computational Omics Research (ENCORE), Emory University Atlanta, Georgia (virtual presentation)	Sep 2024
<b>GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Multiplexed Imaging, Invited Presentation</b> Statistical Methods in Imaging, American Statistical Association Statistics in Imaging Section Indianapolis, Indiana	May 2024

## Other Presentations

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<b>Facilitating Valid Statistical Inference in Biomedical Image Synthesis</b> Joint Statistical Meeting, American Statistical Association Portland, Oregon	Aug 2024
<b>Image Imputation and Synthesis in Medical Imaging</b> Vanderbilt Department of Biostatistics Student Journal Club	Sep 2023
<b>Application of Closed-form Gamma Mixture Model in mxIF Cell Gating</b> Statistical Methods in Imaging, American Statistical Association Statistics in Imaging Section Minneapolis, Minnesota	May 2023
<b>Semi-Automated Marker Gating For Multiplexed Imaging Using Constrained Gamma Mixture Models</b> Eastern North American Region Spring Meeting, ENAR Nashville, Tennessee	Mar 2023
<b>Semi-Automated Marker Gating For Multiplexed Imaging Using Constrained Gamma Mixture Models</b> NIH Junior Investigators Atlas Builders Meeting New York, New York	Mar 2023
<b>Faster Estimation for Constrained Gamma Mixture Models Using Closed-Form Estimators</b> Joint Statistical Meeting, American Statistical Association Washington, DC	Aug 2022
<b>Application of closed-form gamma mixture in mxIF cell gating</b> Eastern North American Region Spring Meeting, ENAR Houston, Texas	Mar 2022

## Service

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### Conference Session Organized

- **PANEL: Collaboration 101: What a Scientist Seeks in a Statistician vs What a Statistician Seeks in a Scientist (Co-organizer)**  
ENAR Spring Meeting, New Orleans, Louisiana
- Mar 2025

- **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
- **Member, Council for Emerging and New Statisticians (CENS)** 2024  
**Regional Advisory Board, Eastern North America Region International Biometric Society**
  - Advise and help implement ideas to enhance the benefits of ENAR membership and to increase awareness of the benefits of ENAR membership to students
  - Organize a CENS session at each ENAR Spring Meeting and Joint Statistical Meeting
- **Student Representative, Curriculum Review Committee** 2024  
**Department of Biostatistics, Vanderbilt University, Nashville, TN**
  - 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, social events
  - Treasurer 2022
    - Handled reimbursement for all activities
    - Performed budget planning
- **Columbia Statistics Club, Columbia University, New York, NY**
  - Vice President and Chair of Public Relations 2018-2019
    - Coordinated club departments and faculty involvement for all events
    - Coordinated joint events with other student organizations

## Teaching

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- **Teaching Assistantship, Department of Biostatistics Vanderbilt University, Nashville, TN**
  - Contemporary Statistical Inference Spring 2024
  - Statistical Collaboration in Health Sciences Fall 2023
  - Regression Modeling Strategies Spring 2023
  - Advanced Concepts in Probability and Real Analysis for Biostatisticians Fall 2022