

Jiangmei (Ruby) Xiong

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Education

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

Publications

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*.

Software Packages

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, which significantly reduces the computational time.

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

Professional Experience

Academic Contractor/Intern, Global PK/PD and Pharmacometrics

May 2024 - Aug 2024

Eli Lilly and Company, Indianapolis, IN

Project title: "Translation of ADC PK parameters from pre-clinical species to humans"

- Performed 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

Dec 2020 - present

Vanderbilt University, Nashville, TN

Supervisor: Simon Vandekar

- Developed statistical methods for multiplexed immunofluorescence imaging semi-automated marker gating
- Investigated statistical bias in AI-based image synthesis algorithms, including mIF and neuroimaging.
- Collaborative research in radiology and psychiatry: Retrospective analyses of ECT for catatonia, and cognitive deficits in frontal temporal lobe dementia.
- Contributed to an R package for measurement error modeling and authored a software manuscript.

Research Intern, Belsky Lab, Robert N. Butler Columbia Aging Center

2020

Columbia University Mailman School of Public Health, New York

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

2019-2020

Harvard Medical School, Remote

Mentor: Yulin Hswen

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

Professional Skills

Computing Language

R (proficient), Python (intermediate)

Technical Report Writing

L^AT_EX, Markdown

Version Control

Git/Github

Invited Presentations

GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Multiplexed Imaging, Invited Presentation

Oct 2024

Cancer Systems Biology Consortium Image Analysis Working Group (virtual presentation)

GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Multiplexed Imaging, Invited Presentation

Sep 2024

Emory Network of Computational Omics Research (ENCORE), Emory University
Atlanta, Georgia (virtual presentation)

GammaGateR: Semi-automated Marker Gating for Single-cell Multiplexed Multiplexed Imaging, Invited Presentation

May 2024

Statistical Methods in Imaging, American Statistical Association Statistics in Imaging Section
Indianapolis, Indiana

Other Presentations

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 Model in mxIF Cell Gating

May 2023

Statistical Methods in Imaging, American Statistical Association Statistics in Imaging Section
Minneapolis, Minnesota

Semi-Automated Marker Gating For Multiplexed Imaging Using Constrained Gamma Mixture Models

Mar 2023

Eastern North American Region Spring Meeting, ENAR
Nashville, Tennessee

Semi-Automated Marker Gating For Multiplexed Imaging Using Constrained Gamma Mixture Models

Mar 2023

NIH Junior Investigators Atlas Builders Meeting
New York, New York

Faster Estimation for Constrained Gamma Mixture Models Using Closed-Form Estimators

Aug 2022

Joint Statistical Meeting, American Statistical Association
Washington, DC

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

- **PANEL: Collaboration 101: What a Scientist Seeks in a Statistician vs What a Statistician Seeks in a Scientist (Co-organizer)** Mar 2025
ENAR Spring Meeting, New Orleans, Louisiana
- **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
- Vice President 2023
- Treasurer 2022

Columbia Statistics Club, Columbia University, New York, NY

- Vice President and Chair of Public Relations 2018-2019

Teaching

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