

Lingyi Peng

☎ (+1)470-423-9725 | ✉ lingyi.peng@pitt.edu | 📍 130 De Soto St, Pittsburgh, PA 15261

Education

University of Pittsburgh

PhD Student in Biostatistics

Pittsburgh, PA, USA

Sept. 2020 - Jun. 2026 (Expected)

- Advisor: Dr. Tingting Zhang
- Dissertation: A Two-Factor Random Effects Framework for Multimodal Brain Imaging Analysis
- Relevant Courses: Bayesian Statistics, Machine Learning, Survival Analysis, Longitudinal and Clustered Data Analysis, Statistical Estimation Theory

Emory University

MS in Biostatistics

Atlanta, GA, USA

Sept. 2018 - May 2020

- Advisor: Dr. Benjamin Risk

Wuhan University

BS in Statistics

Wuhan, Hubei, China

Sept. 2014 - Jul. 2018

Research Experience

Department of Biostatistics, University of Pittsburgh

Methodology research for doctoral thesis; Advisor: Dr. Tingting Zhang

Pittsburgh, PA, USA

Oct. 2021 - Present

- Developed a novel two-factor random effects model to decompose brain functional connectivity (FC) and structural connectivity (SC) variability into subject-level, edge-level, and interaction effects, revealing that the two approaches yield divergent insights into brain structure-function relationships
- Reframed brain imaging hypothesis testing from a comprehensive statistical perspective, enabling precise and interpretable identification of correspondence across different imaging modalities
- Built a Bayesian model to estimate age-related structural changes and clustered over 60,000 neural edges into networks based on similar aging trajectories
- Developed scalable data pipelines on high-performance computing (HPC) systems to collect, preprocess, and analyze dMRI and fMRI datasets from over 5,000 human subjects

Clinical and Translational Science Institute, University of Pittsburgh

Graduate Student Researcher; Mentor: Dr. Yan Ma

Pittsburgh, PA, USA

Aug. 2024 - Present

- Provide statistical consultation and analysis to physicians at the University of Pittsburgh Medical Center (UPMC) for 20+ projects, and serve as coauthor on 10+ papers
- Effectively communicate with collaborators from diverse fields (dermatology, neuroscience, cardiology, oncology, imaging, psychiatry, etc.) to understand the research interests and background, and propose high-level analysis plans or suggestions
- Used R, Stata, and SAS for statistical modeling, data cleaning, simulation studies, and reproducible reporting in biomedical and clinical research settings

Department of Biostatistics, Emory University

Methodology research for master's thesis; Advisor: Dr. Benjamin Risk

Atlanta, GA, USA

Feb. 2019 - May 2020

- Applied multiple machine learning models, including random forest and XGBoost, to identify brain regions most affected by Alzheimer's disease and predict disease status based on regional brain changes. The prediction model achieved an accuracy score of 78.6% in identifying Alzheimer's disease status

Technical Skills

- **Programming Languages:** Proficient in R, Python, MATLAB, Bash, SAS, and STATA.
- **Statistical Methods:** Experienced with Bayesian statistics, survival analysis, longitudinal modeling, causal inference, generalized linear models (GLM), nonparametric regression, missing data imputation, propensity score methods, functional principal component analysis (fPCA), change point detection, and meta-analysis.
- **Machine Learning:** Familiar with k-means clustering, random forests, support vector machines (SVM), and XGBoost.

- **Brain Imaging Analysis:** Experienced with ANTs, FSL, FreeSurfer, MRtrix3, and DSI Studio.

Publications

Methodological and Major Publications

- [1] **Peng, L.***, Wang, Q.*, Wang, Y., He, J., Li, S., Zou, X., Tudorascu, D. L., Schaeffer, D. J., Schaeffer, L., Szczupak, D., Rothwell, E. S., Sukoff Rizzo, S. J., Carter, G. W., Silva, A. C., & Zhang, T. (2025). A new random effects model for quantifying the relationship between structural connectivity and functional connectivity in the human brain. *Imaging Neuroscience. Under review.* (* equal contribution) [\[Link\]](#)
- [2] Angelo, S., **Peng, L.**, Balasubramani, G. K., Squires, K. M., Dorazio, A. J., Clark, L., Harrison, L., McCreary, E. K., Rudd, K. E., Doi, Y., & Shields, R. K. (2025). Genetic epidemiology and clinical characteristics of *Stenotrophomonas maltophilia*. *The Lancet Microbe. Under review.*
- [3] Knapp, M., Ozbay, B., Nassar, A., Jiang, B., Simon, M., **Peng, L.**, Ma, Y., & Pacella, J. J. (2025+). Ultrasound estimation of right atrial pressure predicts readmission in patients with heart failure. *Journal of the American College of Cardiology. Under review.*
- [4] **Peng, L.***, Wang, Q.*, Nichols, T. E., Wang, Y., He, J., Zou, X., Tudorascu, D. L., Schaeffer, D. J., Schaeffer, L., Szczupak, D., Silva, A. C., & Zhang, T. (2025+). A Random-Effects Modeling Framework for Quantifying Correspondence Between Multimodal Brain Maps. *Ready for submission.*
- [5] **Peng, L.**, He, J., & Zhang, T. (2025+). Assessing age-related changes in structural and functional brain connectivity using two-factor random effects models. *Under preparation.*
- [6] He, J., Zou, X., **Peng, L.**, Wang, Q., & Zhang, T. (2025+). Censoring-aware harmonized modeling of lifespan changes in structural brain connectivity using HCP data. *Under preparation.*
- [7] Wang, Y., Li, S., He, J., **Peng, L.**, Wang, Q., Zou, X., Tudorascu, D. L., Schaeffer, D. J., Schaeffer, L., Szczupak, D., Park, J. E., Sukoff Rizzo, S. J., Carter, G. W., Silva, A. C., & Zhang, T. (2025). Analysis of functional connectivity changes from childhood to old age: A study using HCP-D, HCP-YA, and HCP-A datasets, *Imaging Neuroscience*, 3, imag_a_00503. [\[Link\]](#)
- [8] Wang, Y., Yan, G., Wang, X., Li, S., **Peng, L.**, Tudorascu, D. L., & Zhang, T. (2023). A variational Bayesian approach to identifying whole-brain directed networks with fMRI data. *The Annals of Applied Statistics*, 17(1), 518–538. [\[Link\]](#)

Collaborative Publications

- [1] Hua, K., LeVasseur, C., Pitcairn, S., **Peng, L.**, Ma, Y., Okonkwo, D., Lee, J. Y., Shaw, J., Donaldson, W., & Anderst, W. (2025). “Pre-operative patient-specific factors predict the change in adjacent segment range of motion three years after anterior cervical discectomy and fusion. *Spine. Under Review.*
- [2] Sebastiani, R. S., LeVasseur, C. M., Como, C. J., Hua, K., Pitcairn, S. W., **Peng, L.**, Baldoni, P. L., Ma, Y., Shaw, J. D., Donaldson, W. F., Lee, J. Y., & Anderst, W. J. (2025). Superior adjacent segment motion increases more after autograft than after allograft three years following anterior cervical discectomy and fusion. *Spine. Minor revision.*
- [3] Shah, S., **Peng, L.**, Balasubramani, G. K., & Shields, R. (2025+). Survival ROC and bootstrapping analyses identify an optimal serum albumin cutoff for predicting time to blood culture sterilization in MSSA bacteremia. *Ready to submit to Journal of Antimicrobial Chemotherapy.*
- [4] Szczupak, D., Bhik-Ghanie, R., **Peng, L.**, Zhang, B., Wang, Q., Papoti, D., Campos, V. P., Dubberly, L. R., Hitchens, T. K., Yeh, F., Schaeffer, L. H., Zhang, T., Carter, G. W., Sukoff Rizzo, S. J., Schaeffer, D., & Silva, A. C. (2025+). MRI assessment of healthy aging trajectories of the marmoset brain. *Ready for submission.*
- [5] Carpio Tumba, M., Lomanto Silva, R., Sung, L., **Peng, L.**, Ma, Y., Pedraza-Arévalo, L. C., Gupta, S., Gwak, J., Mohamadi, A., Loudon, D., Stovall, R., Singh, N., Saygin, D., Lieber, S. B., Lee, J., & Sattui, S. E. (2025+). Inclusion of older adults in pharmacologic randomized controlled clinical trials of autoimmune rheumatic diseases: A systematic review and meta-analysis. *Under preparation.*
- [6] Shah, S., Clarke, L., **Peng, L.**, Balasubramani, G. K., Smith, B. J., & Shields, R.. (2025) Impact of hypoalbuminemia on patients receiving ertapenem combination therapy for methicillin-susceptible *Staphylococcus aureus* bacteremia. *Journal of Antimicrobial Chemotherapy*, 80(7), 1823-1827. [\[Link\]](#)
- [7] Goswami, A. K., Kokabi, N., Khaja, M. S., Saad, W. E., Khaja, A., Vashi, A. P., **Peng, L.**, ... & Majdalany, B. S.. (2023) Academic radiology in the United States: Defining gender disparities in faculty leadership and academic rank. *Academic Radiology*, 29(5), 714–725. [\[Link\]](#)
- [8] Kim, S., Hoch, M. J., **Peng, L.**, Somasundaram, A., Chen, Z., & Weinberg, B. D.. (2022) “A brain tumor reporting and data system to optimize imaging surveillance and prognostication in high-grade gliomas”. *Journal of Neuroimaging. [Link]*

Presentations and Posters

- Hua, K., LeVasseur, C., Pitcairn, S., Sebastiani, R., Como, C., Barbosa, S. O., Ma, Y., **Peng, L.**, Shaw, J., Donaldson, W., Lee, J. Y., & Anderst, W.. “Preoperative disc degeneration and age predict changes in adjacent segment kinematics three years after anterior cervical discectomy and fusion.”. *Global Spine Congress, Rio de Janeiro, Brazil. May 2025*
- **Peng, L.**, Wang, Q., Wang, Y., Li, S., He, J., Tudorascu, D. L., Schaeffer, D. J., Schaeffer, L., Szczupak, D., Park, J. E., Rizzo, S. J. S., Carter, G. W., Silva, A. C., & Zhang, T.. “Why functional and structural connectivity don’t always align: Unveiling variability across brain networks”. *ASA Pittsburgh Chapter Banquet, Pittsburgh PA, Apr. 2025*
- **Peng, L.**, Wang, Q., Wang, Y., Li, S., He, J., Tudorascu, D. L., & Zhang, T.. “Investigating the relationship between brain structural connectivity and functional connectivity”. *Keystone State Statistics Symposium, Pittsburgh PA, Oct. 2024*
- Wang, Y., Li, S., He, J., **Peng, L.**, Tudorascu, D. L., Schaeffer, D. J., Schaeffer, L., Szczupak, D., Park, J. E., Rizzo, S. J. S., Carter, G. W., Silva, A. C., Zhang, T., & the Alzheimer’s Disease Neuroimaging Initiative. “Whole-brain functional connectivity change from adolescence to old age”. *Aging Research Day, Pittsburgh PA, Oct. 2023*

Teaching Experience

University of Pittsburgh

Teaching Assistant

Fall 2023 & Spring 2024

- Courses: BIOST 2041 (Introduction to Statistical Methods), BIOST 2011 (Principles of Statistical Reasoning)
- Supported lectures and labs, held office hours, and provided feedback on assignments and projects.