

XINHUI LI

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SUMMARY

Research Scientist specializing in multimodal representation learning, generative modeling, medical imaging analysis, and large language model systems. Experience developing and deploying multimodal AI systems across academia and industry, including production pipelines at Amazon. Published in leading venues such as Nature Human Behaviour and IEEE conferences. Seeking research roles advancing foundation models for healthcare applications.

EDUCATION

Georgia Institute of Technology <i>Doctor of Philosophy in Electrical and Computer Engineering (GPA: 4.0/4.0)</i>	Atlanta, GA, US August 2021–May 2026 (Expected)
University of Pennsylvania <i>Master of Science in Computer and Information Technology (GPA: 4.0/4.0)</i>	Coursera May 2019–August 2021
Columbia University <i>Master of Science in Biomedical Engineering (GPA: 4.0/4.3)</i>	New York, NY, US August 2017–December 2018
Xiamen University <i>Bachelor of Science in Pharmaceutical Science (GPA: 3.6/4.0)</i>	Xiamen, FJ, CN August 2013–July 2017
Utrecht University <i>Exchange Student in Economics and Humanities</i>	Utrecht, UT, NL February 2016–June 2016

WORK EXPERIENCE

Graduate Research Assistant <i>TReNDS Center, Georgia Institute of Technology Advisors: Vince D. Calhoun, Rogers F. Silva</i>	August 2021–Present Atlanta, GA, US
<ul style="list-style-type: none">Led development of a multi-agent system built on large language models (LLMs) for mental disorder assessment, achieving clinician-level agreement on diagnostic benchmarks.Developed Torch-MISA, a scalable multimodal representation learning framework in PyTorch for nonlinear independent subspace analysis, improving phenotype prediction robustness and reproducibility across multiple neuroimaging modalities.Designed an unsupervised learning framework leveraging variational autoencoders (VAEs) to model functional connectivity trajectories in neuropsychiatric populations.Investigated how preprocessing pipeline choice affects supervised learning performance and proposed pipeline-invariant representation learning methods, improving brain-phenotype prediction robustness by 19%.	
Data Scientist Intern <i>Amazon</i>	May 2024–August 2024 Sunnyvale, CA, US
<ul style="list-style-type: none">Designed and deployed a multimodal validation pipeline using vision-language models (VLMs) to automate Alexa product certification, achieving > 99.5% accuracy on image and > 96.7% accuracy on video test cases.	
Assistant Research Engineer <i>Computational Neuroimaging Lab, Child Mind Institute Advisors: Michael P. Milham, Ting Xu</i>	June 2019–August 2021 New York, NY, US
<ul style="list-style-type: none">Developed C-PAC, an open-source software toolbox for MRI preprocessing and analysis, harmonizing three commonly-used pipelines with inter-pipeline connectome correlations > 0.99 and enhancing reproducibility of neuroimaging workflows.Developed DeepBet and DeepSeg, U-Net models leveraging transfer learning for brain extraction and tissue segmentation on non-human primate structural MRI, achieving mean Dice coefficients > 0.97 across multi-site datasets.	
Graduate Research Assistant <i>Hood Visual Science Lab, Columbia University Advisor: Donald C. Hood</i>	June 2018–May 2019 New York, NY, US
<ul style="list-style-type: none">Designed convolutional neural networks (CNNs) to detect glaucoma with wide-field OCT scans, achieving AUCs of 0.93 – 0.99; applied Grad-CAM for model interpretability; improved cross-cohort generalization by 5 – 9% through data augmentation and multimodal input integration.	

MENTORING & TEACHING EXPERIENCE

Undergraduate Research Mentor

2026

Petit Scholar Undergraduate Research Program, Georgia Institute of Technology

- Mentoring one undergraduate student in optimizing group principal component analysis for robust spatiotemporal pattern discovery in functional brain imaging.

Undergraduate Research Mentor

Summers 2022, 2024, 2025

Math Path Program and D-MAP Summer Program, Georgia State University

- Mentored one undergraduate student in translating the multi-dataset independent subspace analysis (MISA) codebase from MATLAB to PyTorch, supporting scalable and reproducible neuroimaging analysis.
- Mentored two undergraduate students in optimizing hyperparameters for independent vector analysis models using Torch-MISA, enhancing model accuracy and efficiency.
- Mentored three undergraduate students in developing a multi-agent system for depression assessment.

Graduate Teaching Assistant

Fall 2020, Spring 2021

CIT 595 Computer Systems Programming, University of Pennsylvania | Instructor: Boon Thau Loo

- Instructed a graduate-level class of approximately 200 students, developing a Gradescope autograder, holding weekly office hours, moderating Piazza discussions, and grading exams.

SKILLS

Languages: Mandarin (Native), English (Proficient), Spanish (Elementary)

Machine Learning: Representation Learning, Generative Models, Foundation Models, Agentic Systems, Computer Vision

Programming Languages: Python, MATLAB, C/C++, Java, JavaScript, R, Shell, HTML, CSS

Deep Learning Frameworks: PyTorch, TensorFlow, Keras, Ollama, HuggingFace

Data Science Libraries: NumPy, Pandas, Scikit-Learn, SciPy, Statsmodels, Matplotlib, Seaborn, Wandb, Optuna

Cloud Computing and Virtualization Platforms: Amazon Web Services, Google Cloud, Docker, Singularity

Neuroimaging Tools: AFNI, ANTs, FSL, FreeSurfer, SPM, Nipype, Nilearn

AWARDS

Mental Health and AI (MEXA) Hackathon First Place | *Neuromatch, Wellcome Trust and Google* 2024

NextGen Scholar Award | *IEEE Engineering in Medicine and Biology Society* 2024

Distinguished Scholar Award | *TReNDS Center and D-MAP Center* 2023

Society of Women Engineers Conference Travel Award | *Georgia Institute of Technology* 2023

Student-Postdoc Travel Award | *Resting State Brain Connectivity Conference* 2023

Diversity in Technology Scholarship | *Cadence* 2022

Electrical and Computer Engineering Fellowship | *Georgia Institute of Technology* 2021

Above and Beyond Outstanding Employee Award | *Child Mind Institute* 2021

Columbia Business School Hackathon First Place | *Columbia University* 2019

Outstanding Graduate | *Xiamen University* 2017

Study Abroad Scholarship | *Xiamen University* 2016

Outstanding Student | *Xiamen University* 2014–2016

First-Class Excellent Student Scholarship | *Xiamen University* 2014–2016

LEADERSHIP & MEMBERSHIP

Fellow | *Georgia Tech Technical AI Safety Fellowship Program* 2025

Scholar | *Georgia Tech/Emory Computational Neural-Engineering Training Program (CNTP)* 2022–2026

Chair | *Georgia Tech/Emory CNTP Professional Development Committee* 2023–2024

Fellow | *Georgia Tech Women in Engineering Graduate Women's Fellowship Program* 2023–2024

Member | *Organization for Human Brain Mapping (OHBM) Communications Committee* 2022–2024

Website and Communications Manager | *OHBM Brain-Art Special Interest Group* 2021–2024

Scholar | *Xiamen University Siyuan Excellent Student Training Program* 2014–2017

Vice President | *Xiamen University Sunshine Psychology Volunteer Team* 2014–2015

PROFESSIONAL SERVICE

Lead Organizer: Georgia Tech/Emory CNTP Professional Development Workshops 2023-2024

Co-Organizer: OHBM Brain-Art Exhibitions and Competitions 2022-2024, Educational Course 2024, Brainhack 2023

Roundtable Junior Chair: ML4H 2022

Journal Reviewer: Imaging Neuroscience, Human Brain Mapping, Journal of Open Source Software

Conference Reviewer: ML4H 2025, OHBM 2023-2024, ICML 2024, ICLR 2024, NeurIPS 2023, MICCAI 2023

PUBLICATIONS

Journal Articles

- **Xinhui Li** and Vince D Calhoun. **Artificial intelligence for schizophrenia: from unimodal prediction to multimodal characterization.** *Current Opinion in Psychiatry*, pages 10–1097, 2026
- Yufang Yang, Anibal Sólón Heinsfeld, Andrea Gondová, Bruno Hebling Vieira, Qing Wang, **Xinhui Li**, et al. **Proceedings of the OHBM Hackathon 2023.** *Aperture Neuro*, 5, 2025
- **Xinhui Li**, Nathalia Bianchini Esper, Lei Ai, Steve Giavasis, Hecheng Jin, Eric Feczko, Ting Xu, Jon Clucas, Alexandre Franco, Anibal Sólón Heinsfeld, Azeez Adebimpe, Joshua Vogelstein, Chao-Gan Yan, Oscar Esteban, Russell Poldrack, Cameron Craddock, Damien Fair, Theodore Satterthwaite, Gregory Kiar, and Michael Milham. **Moving beyond processing-and analysis-related variation in resting-state functional brain imaging.** *Nature Human Behaviour*, 8(10):2003–2017, 2024
- Rogers Silva, Eswar Damaraju, **Xinhui Li**, Peter Kochonov, Judith M. Ford, Daniel H. Mathalon, Jessica A. Turner, Theo G.M. van Erp, Tulay Adali, and Vince D. Calhoun. **A Method for Multimodal IVA Fusion Within a MISA Unified Model Reveals Markers of Age, Sex, Cognition, and Schizophrenia in Large Neuroimaging Studies.** *Human Brain Mapping*, 45(17):e70037, 2024
- Weizheng Yan, Godfrey D Pearlson, Zening Fu, **Xinhui Li**, Armin Irají, Jiayu Chen, Jing Sui, Nora D Volkow, and Vince D Calhoun. **A brainwide risk score for psychiatric disorder evaluated in a large adolescent population reveals increased divergence among higher-risk groups relative to control participants.** *Biological Psychiatry*, 95(7):699–708, 2024
- Gregory Kiar, Jon Clucas, Eric Feczko, Mathias Goncalves, Dorota Jarecka, Christopher J Markiewicz, Yaroslav O Halchenko, Robert Hermosillo, **Xinhui Li**, Oscar Miranda-Dominguez, et al. **Align with the NMIND consortium for better neuroimaging.** *Nature Human Behaviour*, 7(7):1027–1028, 2023
- Michael Milham, Chris Petkov, Pascal Belin, Suliann Ben Hamed, Henry Evrard, Damien Fair, Andrew Fox, Sean Froudust-Walsh, Takuya Hayashi, Sabine Kastner, et al. **Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging.** *Neuron*, 110(1):16–20, 2022
- Xindi Wang, **Xinhui Li**, Jae Wook Cho, Brian E. Russ, Nanditha Rajamani, Alisa Omelchenko, Lei Ai, Annachiara Korchmaros, Stephen Sawiak, R. Austin Benn, Pamela Garcia-Saldivar, Zheng Wang, Ned H. Kalin, Charles E. Schroeder, R. Cameron Craddock, Andrew S. Fox, Alan C. Evans, Adam Messinger, Michael P. Milham, and Ting Xu. **U-net model for brain extraction: Trained on humans for transfer to non-human primates.** *NeuroImage*, 235:118001, 2021
- Kaveri A. Thakoor, **Xinhui Li**, Emmanouil Tsamis, Zane Z. Zemborain, Carlos Gustavo De Moraes, Paul Sajda, and Donald C. Hood. **Strategies to Improve Convolutional Neural Network Generalizability and Reference Standards for Glaucoma Detection From OCT Scans.** *Translational Vision Science & Technology*, 10(4):16, 2021

Preprints

- **Xinhui Li**, Peter Kochonov, Tulay Adali, Rogers F. Silva*, and Vince D. Calhoun*. **Multimodal subspace independent vector analysis effectively captures the latent relationships between brain structure and function.** *bioRxiv*, 2026
- **Xinhui Li**, Eloy Geenjaer, Zening Fu, Godfrey D. Pearlson, and Vince D. Calhoun. **Brain functional network connectivity interpolation characterizes the neuropsychiatric continuum and heterogeneity.** *bioRxiv*, 2026

Conference Proceedings

- Adam Greene*, Neviah Blair*, Samin Mahdipour Aghabagher, Simmi Kumari, Micheal W. Schlund, Alex Fedorov, Vince D. Calhoun, **Xinhui Li***, and Rogers F. Silva*. **AI Psychiatrist Assistant: An LLM-based Multi-Agent System for Depression Assessment from Clinical Interviews.** In *Proceedings of the 5th Machine Learning for Health Symposium*, Proceedings of Machine Learning Research. PMLR, 2025
- **Xinhui Li**, Xindi Wang, Kathleen Mantell, Estefania Cruz Casillo, Michael Milham, Alex Opitz, and Ting Xu. **DeepSeg: a transfer-learning segmentation tool for limited sample training of nonhuman primate MRI.** In *2024 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pages 1–4. IEEE, 2024
- Hyunkyung Shin, **Xinhui Li**, Zening Fu, and Henrik von Coler. **Schizosymphony: From Schizophrenia Brainwaves to Narrative Soundscapes.** In *29th International Conference on Auditory Display (ICAD)*. ICAD, 2024

- **Xinhui Li**, Tulay Adali, Rogers Silva*, and Vince Calhoun*. **Multimodal subspace independent vector analysis better captures hidden relationships in multimodal neuroimaging data.** In *2023 IEEE 20th International Symposium on Biomedical Imaging (ISBI)*, pages 1–5. IEEE, 2023
- **Xinhui Li**, Daniel Khosravinezhad, Vince Calhoun, and Rogers Silva. **Evaluating trade-offs in IVA of multimodal neuroimaging using cross-platform multidataset independent subspace analysis.** In *2023 IEEE 20th International Symposium on Biomedical Imaging (ISBI)*, pages 1–5. IEEE, 2023
- **Xinhui Li**, Eloy Geenjaer, Zening Fu, Sergey Plis, and Vince Calhoun. **Mind the gap: functional network connectivity interpolation between schizophrenia patients and controls using a variational autoencoder.** In *2022 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pages 1477–1480. IEEE, 2022
- Kaveri A. Thakoor, **Xinhui Li**, Emmanouil Tsamis, Paul Sajda, and Donald C. Hood. **Enhancing the Accuracy of Glaucoma Detection from OCT Probability Maps using Convolutional Neural Networks.** In *2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pages 2036–2040, 2019

Workshop Publications

- Victoria Yan, Honor Chotkowski, Fengran Wang, **Xinhui Li**, Carl Yang, Jiaying Lu, Runze Yan, Xiao Hu, and Alex Fedorov. **Towards Synthesizing Normative Data for Cognitive Assessments Using Generative Multimodal Large Language Models.** *Workshop on GenAI for Health at the Conference on Neural Information Processing Systems (NeurIPS)*, 2025
- **Xinhui Li**, Shabie Iqbal, and Aditya Bodi. **AlexaTester: A Multimodal Validation Pipeline for Alexa Product Certification.** *Amazon Computer Vision Conference (ACVC) Workshop on Video Understanding*, 2024
- **Xinhui Li**, Alex Fedorov, Mrinal Mathur, Anees Abrol, Gregory Kiar, Sergey Plis, and Vince Calhoun. **Learning pipeline-invariant representation for robust brain phenotype prediction.** *Data-centric Machine Learning Research (DMLR) Workshop at the International Conference on Machine Learning (ICML)*, 2023
- Yujia Xie*, **Xinhui Li***, and Vince D. Calhoun. **Predictive Sparse Manifold Transform.** *Workshop on High-dimensional Learning Dynamics (HLD) at the International Conference on Machine Learning (ICML)*, 2023
- **Xinhui Li**, Alex Fedorov, Mrinal Mathur, Anees Abrol, Gregory Kiar, Sergey Plis, and Vince Calhoun. **Pipeline-Invariant Representation Learning for Neuroimaging.** *Machine Learning for Health (ML4H) Symposium*, 2022

INVITED TALKS

Xinhui Li. **A Method for Multimodal IVA Fusion Within a MISA Unified Model Reveals Markers of Age, Sex, Cognition, and Schizophrenia in Large Neuroimaging Studies.** MINED Research Group at Georgia Institute of Technology, Atlanta, September 2025

Xinhui Li. **Deep Generative Modeling for Latent Source Separation and Psychosis Continuum Estimation from Neuroimaging Data.** Organization for Human Brain Mapping Symposium: *Machine Learning for Brain Imaging: Predicting Traits, Disease Progression, and Treatment Response*, Brisbane, June 2025

Xinhui Li. **Interpretable, Reproducible and Creative Neuroimaging Data Visualization.** Organization for Human Brain Mapping Educational Course: *Communicating neuroscience across peoples, languages, and cultures*, Seoul, June 2024

Xinhui Li. **Moving Beyond Processing and Analysis-Related Variation in Neuroscience.** Chinese Open Science Network OpenTalks, March 2022

Xinhui Li and Hecheng Jin. **C-PAC: A flexible and ease-of-use MRI preprocessing and analysis toolbox.** Chinese Open Science Network OpenTutorials, October 2021

Xinhui Li and Hecheng Jin. **fMRI preprocessing with containers: How to run C-PAC with Docker and Singularity.** Brainhack Global, New York, November 2019

ART EXHIBITIONS

Hyunkyung Shin and **Xinhui Li.** **Schizosymphony: From Schizophrenia Brainwaves to Narrative Soundscapes.** Organization for Human Brain Mapping Brain-Art Exhibition, Seoul, June 2024

Erin Lottes and **Xinhui Li.** **Butterfly Effect.** Organization for Human Brain Mapping Brain-Art Exhibition, Glasgow, June 2022