XINHUI LI

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EDUCATION

Georgia Institute of Technology — Atlanta, GA, US
Ph.D., Electrical and Computer Engineering (GPA: 4.0/4.0) — *Aug 2021 - Exp. May 2026*

University of Pennsylvania — Coursera
M.S., Computer and Information Technology (GPA: 4.0/4.0) — *May 2019 - Aug 2021*

Columbia University — New York, NY, US
M.S., Biomedical Engineering (GPA: 4.0/4.3) — *Aug 2017 - Dec 2018*

Xiamen University — Xiamen, FJ, CN
B.S., Pharmaceutical Science (GPA: 3.6/4.0) — *Aug 2013 - Jul 2017*

Utrecht University — Utrecht, UT, NL
Exchange Student, Economics and Humanities — *Feb 2016 - Jun 2016*

PROFESSIONAL EXPERIENCE

Graduate Research Assistant — Aug 2021 - Present
Center for Translational Research in Neuroimaging and Data Science | Advisors: Vince Calhoun, Rogers Silva — *Atlanta, GA, US*

- Developing a deep multidataset independent subspace analysis framework to identify biomarkers of phenotypes and psychiatric disorders from multimodal neuroimaging data.
- Developed a functional network connectivity interpolation framework using a variational autoencoder to estimate individual heterogeneity and psychosis continuum between controls and patients.
- Evaluated the impact of preprocessing pipeline selection on the downstream performance of a supervised learning model and developed pipeline-invariant representation learning methodologies to improve brain-phenotype prediction robustness.

Assistant Research Engineer — Jun 2019 - Aug 2021
Computational Neuroimaging Lab, Child Mind Institute | Advisors: Michael Milham, Ting Xu — *New York, NY, US*

- Developed the software Configurable Pipeline for the Analysis of Connectomes (C-PAC) for magnetic resonance imaging (MRI) processing and analysis; implemented fMRIPrep-options, XCP-options, ABCD-options, CCS-options, longitudinal, surface, non-human primate, and rodent pipelines in C-PAC.
- Developed a U-Net model and a transfer learning paradigm for brain extraction and tissue segmentation on non-human primate structural MRI data.
- Improved brain-behavior variance explained using shared response model on Human Connectome Project data.
- Analyzed spatial temporal dynamics and inter-subject correlation on naturalistic neuroimaging data.

Graduate Research Assistant — Jun 2018 - May 2019
Hood Visual Science Lab, Columbia University | Advisor: Donald Hood — *New York, NY, US*

- Designed convolutional neural networks (CNN) to identify glaucoma with wide-field optical coherence tomography (OCT) scans; applied grad-cam and attention map to explain CNN features; implemented multiple strategies, such as data augmentation and multimodal input, to enhance model generalizability.
- Built MATLAB-based APIs for qualitative and quantitative measures of glaucoma progression in both early and advanced glaucoma datasets using wide-field OCT scans.

Graduate Research Assistant — Aug 2018 - May 2019
New York State Psychiatric Institute | Advisor: Xiaofu He — *New York, NY, US*

- Designed a motor imagery task interface for electroencephalogram (EEG) data recordings using PsychoPy.
- Developed a cascade ResNet-LSTM deep learning model to classify motor imagery EEG signals.

Graduate Research Assistant — Feb 2018 - May 2019
Laboratory for Intelligent Imaging and Neural Computing, Columbia University | Advisor: Paul Sajda — *New York, NY, US*

- Collected eye tracking data in three conditions when subjects watch lecture videos with soundtrack, slides and the speaker, to assess determinant factors in online courses.
- Analyzed eye tracking data of video study using the structural equation model to explore the relationship between the amount of information loading and the mechanism of cognitive regulation.

Teaching Appointments

Graduate Teaching Assistant

CIT 595 Computer Systems Programming, University of Pennsylvania | Instructor: Boon Thau Loo *Fall 2020, Spring 2021*

- Developed an autograder, held weekly office hours, answered students' questions in discussion forum, graded exams.

Skills

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

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

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

Deep Learning Libraries: PyTorch, TensorFlow, Keras, Weka

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

Awards

Distinguished Scholar Award | *Georgia State/Georgia Tech/Emory 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 Award | *Child Mind Institute*	2021
Columbia Business School Hackathon First Prize | *Columbia University*	2019
Outstanding Graduate | *Xiamen University*	2017
Study Abroad Scholarship | *Xiamen University*	2016
Outstanding Student Cadre | *Xiamen University*	2014, 2015, 2016
First Class Excellent Student Scholarship | *Xiamen University*	2014, 2015, 2016

Leadership & Membership

Scholar | *Georgia Tech/Emory Computational Neural-Engineering Training Program (CNTP)*	2022 - 2025
Chair | *Georgia Tech/Emory CNTP Professional Development Committee*	2023 - 2024
Fellow | *Georgia Tech Women In Engineering Graduate Women's Fellowship Program*	2023 - 2024
Student Member | *Organization for Human Brain Mapping (OHBM)*	2021 - 2025
Brain-Art Liaison | *OHBM Program Committee*	2023 - 2024
Member and Brain-Art Liaison | *OHBM Communications Committee*	2022 - 2024
Website and Communications Manager | *OHBM Brain-Art Special Interest Group*	2021 - 2024
Student Member | *Institute of Electrical and Electronics Engineers (IEEE)*	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 Computational Neural-Engineering Training Program (CNTP) Events: Scientific Rigor Workshop (September 2024), Industry Panel Discussion (April 2024), Science-Art Communication Workshop (March 2024), Scientific Communication on Social Media Workshop (December 2023)
- Chinese Open Science Network OpenTalks: *Seeing Beyond the Brain: Conditional Diffusion Model with Sparse Masked Modeling for Vision Decoding* by Zijiao Chen, March 2023

Co-Organizer

- Organization for Human Brain Mapping (OHBM) Brain-Art Exhibition and Competition: *The Connected Brain* (2022), *The Multifaceted Brain: Adaptation and Diversity* (2023), *Beyond Borders* (2024)
- OHBM Brainhack: *Venture into the untapped depths of the brain* (2023)
- OHBM Educational Course: *Communicating neuroscience across peoples, languages, and cultures* (2024)

Roundtable Junior Chair

- Machine Learning for Health (ML4H) Symposium 2022

Reviewer

- Journal of Open Source Software
- Organization for Human Brain Mapping (OHBM) 2023, 2024
- International Conference on Machine Learning (ICML) 2024
- International Conference on Learning Representations (ICLR) 2024
- Advances in Neural Information Processing Systems (NeurIPS) 2023
- The Medical Image Computing and Computer Assisted Intervention Society (MICCAI) 2023

PEER-REVIEWED PUBLICATIONS

Hyunkyung Shin* and **Xinhui Li***. **Schizosymphony: From Schizophrenia Brainwaves To Narrative Soundscape**. In *29th International Conference on Auditory Display (ICAD)*. ICAD, 2024

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)*. IEEE, 2024

Weizheng Yan, Godfrey D Pearlson, Zening Fu, **Xinhui Li**, Armin Iraji, Jiayu Chen, Jing Sui, Nora D Volkow, and Vince D Calhoun. **A brain-wide risk score for psychiatric disorder evaluated in a large adolescent population reveals increased divergence among higher-risk groups relative to controls**. *Biological Psychiatry*, 2023

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

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*, pages 1–2, 2023

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, 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

Xinhui Li, Eloy Geenjaar, 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

Michael Milham ... **Xinhui Li** ... **Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging**. *Neuron*, 2021

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*, 10:16, 2021

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

PREPRINTS

Xinhui Li, Tulay Adali, Rogers Silva, and Vince Calhoun. **Multimodal subspace independent vector analysis captures latent subspace structures in large multimodal neuroimaging studies**. *bioRxiv*, 2023

Rogers Silva, Eswar Damaraju, **Xinhui Li**, Peter Kochonov, Aysenil Belger, Judith M. Ford, Daniel H. Mathalon, Bryon A. Mueller, Steven G. Potkin, Adrian Preda, Jessica A. Turner, Theo G.M. van Erp, Tulay Adali, and Vince D. Calhoun. **Direct linkage detection with multimodal IVA fusion reveals markers of age, sex, cognition, and schizophrenia in large neuroimaging studies**. *bioRxiv*, 2022

Xinhui Li, Lei Ai, Steve Giavasis, Hecheng Jin, Eric Feczko, Ting Xu, Jon Clucas, Alexandre Franco, Anibal Sólon 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 Neuroscience**. *bioRxiv*, 2021

INVITED TALKS

Xinhui Li. **Interpretable, reproducible and creative neuroimaging data visualization**. Organization for Human Brain Mapping Educational Course, 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

SELECTED PRESENTATIONS

Xinhui Li, Rogers Silva*, and Vince Calhoun*. **Deep independent vector analysis reveals linked and identifiable nonlinear representations from multimodal neuroimaging data**. Resting State Brain Connectivity Conference, September 2023

Xinhui Li, Rogers Silva, and Vince Calhoun. **Multimodal subspace independent vector analysis better captures hidden relationships in multimodal neuroimaging data**. Suddath Symposium: Biomedical Big Data and AI for Accelerating Bioengineering and Bioscience, March 2023

Xinhui Li, Rogers Silva, and Vince Calhoun. **Cross-platform Multidataset Independent Subspace Analysis**. Collaborative Research in Computational Neuroscience PI meeting, October 2022

Xinhui Li, Lei Ai, Steve Giavasis, Hecheng Jin, Jon Clucas, Alexandre Franco, Eric Feczko, Joshua Vogelstein, Cameron Craddock, Ting Xu, Oscar Esteban, Russell Poldrack, Damien Fair, Theodore Satterthwaite, and Michael Milham. **Putting Pipeline Implementation-related Variation into Perspective for Functional Connectomics**. Organization for Human Brain Mapping, 2021

Xinhui Li, Xindi Wang, Kathleen Mantell, Estefania Casillo Cruz, Michael Milham, Alex Opitz, and Ting Xu. **Toward Automatic Segmentation for Non-human Primates**. 2nd International Workshop on Non-invasive Brain Stimulation, 2021

Xinhui Li, Steve Giavasis, Hecheng Jin, Lei Ai, Anibal Sólon Heinsfeld, Azeez Adebimpe, Alexandre Franco, Russell Poldrack, Joshua Vogelstein, Ting Xu, Theodore Satterthwaite, Oscar Esteban, Cameron Craddock, and Michael Milham. **Evaluating and Improving Cross-Pipeline Reproducibility in Functional Connectomics: A Case Study**. Organization for Human Brain Mapping, 2020

Xinhui Li, Emmanouil Tsamis, Kaveri A. Thakoor, Zane Z. Zemborain, Carlos Gustavo De Moraes, and Donald C. Hood. **Evaluating the transferability of deep learning models that distinguish glaucomatous from non-glaucomatous OCT circumpapillary disc scans**. Investigative Ophthalmology & Visual Science, 2020

ARTS

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

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