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 2025*

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 - Feb 2019*

Xiamen University — Xiamen, FJ, CN
B.S., Pharmaceutical Science (*GPA: 3.65/4.0*) — *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, Georgia Institute of Technology — *Atlanta, GA, US*

- Developing a multidataset independent subspace analysis framework to identify linear and nonlinear latent sources from multimodal neuroimaging data.
- Developing a functional network connectivity interpolation method to estimate continuous alternations between controls and patients with mental disorders (schizophrenia, autism, depression) using a variational autoencoder.
- 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 prediction consistency.

Assistant Research Engineer — Jun 2019 - Aug 2021
Computational Neuroimaging Lab, Child Mind Institute — *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 — Aug 2018 - May 2019
New York State Psychiatric Institute — *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 — Jun 2018 - May 2019
Hood Visual Science Lab, Columbia University — *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 the 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 — Feb 2018 - May 2019
Laboratory for Intelligent Imaging and Neural Computing, Columbia University — *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 illuminate 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 *Fall 2020, Spring 2021*

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

Leadership & Membership

Scholar 2021 - 2025
Georgia Tech/Emory Computational Neural-Engineering Training Program *Atlanta, GA, US*

BrainArt Liaison 2022 - 2023
Organization for Human Brain Mapping Communications Committee *Montreal, QC, CA*

Website and Communications Manager 2022 - 2023
Organization for Human Brain Mapping BrainArt Special Interest Group *Montreal, QC, CA*

Website and Communications Manager Elect 2021 - 2022
Organization for Human Brain Mapping BrainArt Special Interest Group *Glasgow, SC, UK*

Student Member 2021 - 2023
Organization for Human Brain Mapping

Student Member 2021 - 2022
Institute of Electrical and Electronics Engineers

Scholar 2014 - 2017
Xiamen University Siyuan Excellent Student Training Program *Xiamen, FJ, CN*

Vice President 2014 - 2015
Xiamen University Sunshine Psychology Volunteer Team *Xiamen, FJ, CN*

Awards

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 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

Technical Skills

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

Professional Service

Roundtable Junior Chair 2022
Machine Learning for Health (ML4H) Symposium *New Orleans, LA, US*

Program Committee Member 2022
NeurIPS A Participatory Approach to AI for Mental Health (PAI4MH) Workshop *New Orleans, LA, US*

Reviewer
Schizophrenia Bulletin, Journal of Open Source Software, NeurIPS PAI4MH Workshop, OHBM

Publications

Xinhui Li, Alex Fedorov, Mrinal Mathur, Anees Abrol, Gregory Kiar, Sergey Plis, and Vince Calhoun. **Pipeline-Invariant Representation Learning for Neuroimaging**. *arXiv preprint arXiv:2208.12909*, 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)*, 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

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

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

Invited Talks & Presentations

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

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, 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

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