

# XINHUI LI

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## EDUCATION

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

## RESEARCH EXPERIENCE

<b>Graduate Research Assistant</b> <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"><li>Developing a multi-dataset independent subspace analysis framework in PyTorch (Torch-MISA) to identify biomarkers of phenotypes and mental disorders from multimodal neuroimaging data.</li><li>Developing the AI psychiatrist assistant, a multi-agent system based on large language models (LLMs) for measuring mental disorder symptoms from clinical interview transcripts.</li><li>Developed a functional network connectivity interpolation framework using a variational autoencoder to characterize the neuropsychiatric continuum and heterogeneity.</li><li>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.</li></ul>	
<b>Data Scientist Intern</b> <i>Amazon</i>	May 2024 - August 2024 Sunnyvale, CA, US
<ul style="list-style-type: none"><li>Developed a multimodal validation pipeline using a vision-language foundation model to automatically validate audio, image, and video test cases for Alexa product certification.</li><li>Applied advanced prompt engineering techniques such as chain-of-thought, in-context learning and active learning to improve Alexa's validation performance.</li></ul>	
<b>Assistant Research Engineer</b> <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"><li>Developed the software toolbox 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.</li><li>Developed a U-Net model and a transfer learning paradigm for brain extraction and tissue segmentation on non-human primate structural MRI data.</li></ul>	
<b>Graduate Research Assistant</b> <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"><li>Designed convolutional neural networks (CNN) to identify glaucoma with wide-field optical coherence tomography (OCT) scans; applied grad-cam and attention map to explain the CNN features; implemented multiple strategies, such as data augmentation and multimodal input, to enhance model generalizability.</li><li>Built MATLAB-based application programming interfaces (APIs) for qualitative and quantitative measures of glaucoma progression in both early and advanced glaucoma datasets using wide-field OCT scans.</li></ul>	
<b>Graduate Research Assistant</b> <i>Laboratory for Intelligent Imaging and Neural Computing, Columbia University   Advisor: Paul Sajda</i>	February 2018 - May 2019 New York, NY, US
<ul style="list-style-type: none"><li>Collected eye tracking data under three conditions: when subjects watched lecture videos with soundtracks, slides and speakers, to assess determinant factors in online courses.</li><li>Analyzed the eye tracking data from the video study using the structural equation model to explore the relationship between the amount of information loading and the mechanism of cognitive regulation.</li></ul>	

MENTORING & TEACHING EXPERIENCE

<b>Undergraduate Research Mentor</b>	Summers 2022, 2024, 2025
<i>Math Path Program and D-MAP Summer Program, Georgia State University</i>	
<ul style="list-style-type: none"><li>Translated the multi-dataset independent subspace analysis (MISA) codebase from MATLAB to PyTorch.</li><li>Optimized hyperparameters for independent vector analysis problems in Torch-MISA.</li><li>Designed LLM prompts for measuring depression symptoms from clinical interview transcripts.</li></ul>	
<b>Graduate Teaching Assistant</b>	Fall 2020, Spring 2021
<i>CIT 595 Computer Systems Programming, University of Pennsylvania   Instructor: Boon Thau Loo</i>	
<ul style="list-style-type: none"><li>Developed an autograder for Gradescope, held weekly office hours, answered questions in the Piazza discussion forum, and graded exams.</li></ul>	

SKILLS

<b>Languages:</b> Mandarin (Native), English (Proficient), Spanish (Elementary)
<b>Programming Languages:</b> Python, MATLAB, C/C++, Java, JavaScript, R, Shell, HTML, CSS
<b>Deep Learning Frameworks:</b> PyTorch, TensorFlow, Keras, Ollama, Hugging Face Transformers
<b>Data Science Libraries:</b> NumPy, Pandas, Scikit-Learn, SciPy, Statsmodels, Matplotlib, Seaborn, Wandb, Optuna
<b>Cloud Computing and Virtualization Platforms:</b> Amazon Web Services, Google Cloud, Docker, Singularity
<b>Neuroimaging Tools:</b> AFNI, ANTs, FSL, FreeSurfer, SPM, Nipype, Nilearn

AWARDS

<b>Mental Health and AI (MEXA) Hackathon First Place</b>   <i>Neuromatch, Wellcome Trust and Google</i>	2024
<b>NextGen Scholar Award</b>   <i>IEEE Engineering in Medicine and Biology Society</i>	2024
<b>Distinguished Scholar Award</b>   <i>TReNDS Center and D-MAP Center</i>	2023
<b>Society of Women Engineers Conference Travel Award</b>   <i>Georgia Institute of Technology</i>	2023
<b>Student-Postdoc Travel Award</b>   <i>Resting State Brain Connectivity Conference</i>	2023
<b>Diversity in Technology Scholarship</b>   <i>Cadence</i>	2022
<b>Electrical and Computer Engineering Fellowship</b>   <i>Georgia Institute of Technology</i>	2021
<b>Above and Beyond Outstanding Employee Award</b>   <i>Child Mind Institute</i>	2021
<b>Columbia Business School Hackathon First Place</b>   <i>Columbia University</i>	2019
<b>Outstanding Graduate</b>   <i>Xiamen University</i>	2017
<b>Study Abroad Scholarship</b>   <i>Xiamen University</i>	2016
<b>Outstanding Student Cadre</b>   <i>Xiamen University</i>	2014 - 2016
<b>First Class Excellent Student Scholarship</b>   <i>Xiamen University</i>	2014 - 2016

LEADERSHIP & MEMBERSHIP

<b>Fellow</b>   <i>Georgia Tech Technical AI Safety Fellowship Program</i>	2025
<b>Scholar</b>   <i>Georgia Tech/Emory Computational Neural-Engineering Training Program (CNTP)</i>	2022 - 2026
<b>Chair</b>   <i>Georgia Tech/Emory CNTP Professional Development Committee</i>	2023 - 2024
<b>Fellow</b>   <i>Georgia Tech Women in Engineering Graduate Women's Fellowship Program</i>	2023 - 2024
<b>Student Member</b>   <i>Organization for Human Brain Mapping (OHBM)</i>	2021 - 2024
<b>Member and Brain-Art Liaison</b>   <i>OHBM Communications Committee</i>	2022 - 2024
<b>Website and Communications Manager</b>   <i>OHBM Brain-Art Special Interest Group</i>	2021 - 2024
<b>Student Member</b>   <i>Institute of Electrical and Electronics Engineers (IEEE)</i>	2021 - 2024
<b>Scholar</b>   <i>Xiamen University Siyuan Excellent Student Training Program</i>	2014 - 2017
<b>Vice President</b>   <i>Xiamen University Sunshine Psychology Volunteer Team</i>	2014 - 2015

### Lead Organizer

- Georgia Tech/Emory Computational Neural-Engineering Training Program (CNTP) Events: 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 (Speaker: 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 Educational Course: Communicating neuroscience across peoples, languages, and cultures (2024)
- OHBM Brainhack: Venture into the untapped depths of the brain (2023)

### Roundtable Junior Chair

- Machine Learning for Health (ML4H) Symposium 2022

### Reviewer

- Machine Learning for Health (ML4H) Symposium 2025
- 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

## PUBLICATIONS

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### Journal Articles

- **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 Iraj, 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 Froudish-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*, 2024

- **Xinhui Li**, Eloy Geenjaer, Zening Fu, Godfrey D. Pearlson, and Vince D. Calhoun. **Brain functional network connectivity interpolation characterizes neuropsychiatric continuum and heterogeneity**. *bioRxiv*, 2024

## Conference Proceedings

- **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

## Selected Conference Abstracts

- **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 Sólón 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

## INVITED TALKS

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**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

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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