XINHUI LI

xli993@gatech.edu | +1 (646) 280-6835 | Personal Website | Google Scholar | GitHub

EDUCATION

Georgia Institute of Technology, Atlanta, GA, US — Aug 2021 - Exp. May 2025
Ph.D., Bioengineering (Electrical and Computer Engineering)

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

Columbia University, New York, NY, US — Aug 2017 - Feb 2019
M.S., Biomedical Engineering (GPA: 4.0/4.3)

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

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

RESEARCH INTERESTS

Neuroimaging, Machine Learning, Brain Computer Interaction

PROFESSIONAL EXPERIENCE

Graduate Research Assistant — Aug 2021 - Present
TReNDS Center, Georgia Institute of Technology, Atlanta, GA, US
Advisor: Vince D. Calhoun

- Developing supervised and unsupervised deep learning models to diagnose mental disorders (schizophrenia, autism spectrum disorder, depression), identify subtypes and estimate risk scores using structural MRI, functional MRI and functional network connectivity data.
- Developing non-linear multimodal independent subspace analysis framework for neuroimaging data.

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

- Developed the software Configurable Pipeline for the Analysis of Connectomes (C-PAC) for MRI processing and analysis; maintained C-PAC pipeline configuration GUI and user documentation; 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 for brain extraction and tissue segmentation on non-human primate MRI.
- Applied shared response model on Human Connectome Project connectivity data to improve brain-behavior variance explained.
- Analyzed spatial temporal dynamics and inter-subject correlation using naturalistic fMRI data.

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

- Designed a real-time electroencephalogram (EEG) data classification feedback interface.
- Designed an imagery motor movement task interface for EEG data recordings using PsychoPy.
- Developed a cascade ResNet-LSTM deep learning model to classify imaginary motor movement EEG signals.

Hood Visual Science Lab, Columbia University, New York, NY, US
Advisor: Donald C. Hood Jun 2018 - May 2019

- 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 to enhance the generalizability of deep learning models.
- Built MATLAB-based APIs for qualitative and quantitative measures of glaucoma progression in both early and advanced glaucoma datasets using wide-field OCT scans.

Laboratory for Intelligent Imaging and Neural Computing, Columbia University, New York, NY, US
Advisor: Paul Sajda Feb 2018 - May 2019

- Collected eye tracking data in three conditions when subjects watch lecture videos with soundtrack, slides and the speaker, to assess deciding 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.

Undergraduate Research Assistant Sep 2014 - Jun 2017
Pharmacy Informatics Lab, Xiamen University, Xiamen, FJ, CN
Advisors: Xiaokun Zhang, Zhiping Zeng Sep 2016 - Jun 2017

- Analyzed effective compounds from a food database for modulator of an orphan nuclear receptor Nur77 that could induce apoptosis to identify ligands of Nur77.

Pharmacology and Drug Targets Lab, Xiamen University, Xiamen, FJ, CN
Advisor: Liangcheng Li Sep 2014 - May 2017

- Detected insulin secretion in IG20-lacked beta-cells using PCR and gene targeting methods to find the most effective functional area of the gene KIAA0358.

TEACHING EXPERIENCE

University of Pennsylvania, Coursera
Teaching Assistant, CIT 595 Computer Systems Programming Fall 2020, Spring 2021

AWARDS, SCHOLARSHIPS AND MEMBERSHIPS

Georgia Institute of Technology, Atlanta, GA, US
Electrical and Computer Engineering Fellowship 2021

Child Mind Institute, New York, NY, US
Above and Beyond Award 2021

Columbia University, New York, NY, US
First Prize, Columbia Business School & Engineering Graduate Student Council Hackathon 2019

Xiamen University, Xiamen, FJ, CN
Outstanding Graduate 2017
Study Abroad Scholarship 2016
Outstanding Student Cadre 2014, 2015, 2016
First Level Excellent Student Scholarship 2014, 2015, 2016
Member, Siyuan Excellent Student Training Program 2014 - 2017
Vice President, Sunshine Psychology Volunteer Team 2013 - 2015

TECHNICAL SKILLS

Programming Languages: Python, MATLAB, C/C++, Java, JavaScript, R, Shell, HTML, CSS
Neuroimaging Tools: AFNI, ANTs, FSL, FreeSurfer, SPM, Nipype, Nilearn
Deep Learning Libraries: PyTorch, TensorFlow, Keras, Weka
Cloud Computing and Virtualization Platforms: Amazon Web Services, Google Cloud, Docker, Singularity

PUBLICATIONS

Milham, M. P., … **Li, X.,** ... (2021). **Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging.** Neuron. [paper]

Wang, X., **Li, X.,** Cho, J. W., Russ, B., Rajamani, N., Omelchenko, A., Ai, L., Korchmaros, A., Garcia, P., Wang, Z., Kalin, N. H., Schroeder, C. E., Craddock, C., Fox, A. S., Evans, A., Messinger, A., Milham, M. P., & Xu, T. (2021). **U-net model for brain extraction: Trained on humans for transfer to non-human primates.** NeuroImage. [paper]

Thakoor, K. A., **Li, X.,** Tsamis, E., Zemborain, Z. Z., Moraes, C. G. D., Sajda, P., & Hood, D. C. (2020). **Strategies to Improve Convolutional Neural Network Generalizability and Reference Standards for Glaucoma Detection from OCT Scans**. Translational Vision Science and Technology. [paper]

Thakoor, K. A., **Li, X.,** Tsamis, E., Sajda, P., & Hood, D. C. (2019). **Enhancing the Accuracy of Glaucoma Detection from OCT Probability Maps using Convolutional Neural Networks**. 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2036–2040. [paper]

POSTERS AND PRESENTATIONS

Li, X., & Jin, H. **C-PAC: A flexible and ease-of-use MRI preprocessing and analysis toolbox**. OpenTutorials, October 2021. [talk] [slides]

Li, X., & Jin, H. **fMRI Preprocessing with Containers: How to run C-PAC with Docker and Singularity**. Brainhack Global, New York, November 2019. [slides]

Li, X., Ai, L., Giavasis, S., Jin, H., Franco, A. R., Feczko, E., Vogelstein, J. T., Craddock, R. C., Xu, T., Esteban, O., Poldrack, R. A., Fair, D., Satterthwaite, T., Milham, M. P. (2021). **Putting Pipeline Implementation-related Variation into Perspective for Functional Connectomics.** Organization for Human Brain Mapping 2021 Annual Meeting. [poster]

Li, X., Wang, X., Mantell, K., Casillo, E. C., Milham, M. P., Opitz, A., & Xu, T. (2021). Toward Automatic Segmentation for Non-human Primates. 2nd International Workshop on Non-invasive Brain Stimulation (NIBS). [poster]

Li, X., Giavasis, S., Jin, H., Ai, L., Sólon, A., Adebimpe, A., Franco, A. R., Poldrack, R. A., Vogelstein, J. T., Xu, T., Satterthwaite, T., Craddock, R. C., & Milham, M. P. (2020). **Evaluating and Improving Cross-Pipeline Reproducibility in Functional Connectomics: A Case Study**. Organization for Human Brain Mapping 2020 Annual Meeting. [poster]

Li, X., Tsamis, E., Thakoor, K. A., Zemborain, Z. Z., Moraes, C. G. D., & Hood, D. C. (2020). **Evaluating the transferability of deep learning models that distinguish glaucomatous from non-glaucomatous OCT circumpapillary disc scans**. Investigative Ophthalmology & Visual Science, 61(7), 4548–4548. [abstract]

Li, X., Cho, J. W., Milham, M. P., & Xu, T. (2020). **Improving brain-behavior prediction using individual-specific components from connectivity-based shared response model**. Resting-State Brain Connectivity Conference 2022. [abstract]

Wang, X., **Li, X.,** Cho, J. W., Russ, B., Rajamani, N., Omelchenko, A., Ai, L., Korchmaros, A., Garcia, P., Wang, Z., Kalin, N. H., Schroeder, C. E., Craddock, C., Fox, A. S., Evans, A., Messinger, A., Milham, M. P., & Xu, T. (2021). **Transfer-learning U-Net Brain Extraction Tool (DeepBet) on Non-human Primates**. Organization for Human Brain Mapping 2021 Annual Meeting. [poster]

Giavasis, S., Clucas, J., **Li, X.,** Jin, H., Ai, L., Sólon, A., Craddock, R. C., & Milham, M. P. (2021). **The Configurable Pipeline for the Analysis of Connectomes (C-PAC) 2020-2021: Transitioning Out of Beta.** Organization for Human Brain Mapping 2021 Annual Meeting. [poster]

Shirinpour, S., Mantell, K., **Li, X.,** Puonti, O., Madsen, K., Haigh, Z., Casillo, E. C., Alekseichuk, I., Hendrickson, T., Xu, T., Thielscher, A., & Opitz, A. (2021). Extending SimNIBS to integrate non-invasive brain stimulation with functional imaging data and primate head segmentation. The BRAIN Initiative Investigators Meeting. [poster]

Jin, H., Giavasis, S., **Li, X.,** Sólon, A., Ai, L., Franco, A. R., Ramirez, J. S. B., Wang, X., Gozzi, A., Pagani, M., Fox, A., Messinger, A., Fair, D. A., Keilholz, S., Russ, B., Xu, T., Craddock, R. C., & Milham, M. P. (2020). **A Unified, End-to-End Pipeline Solution for Human and Nonhuman Functional Connectomics**. Organization for Human Brain Mapping 2020 Annual Meeting. [poster]

Feng, Y., Chung, E., **Li, X.,** Cycowicz, Y. M., & He, X. (2019). **Deep Learning for Motor Imagery Classification based on EEG Data**. New York Scientific Data Summit 2019. [poster]

Thakoor, K. A., Zheng, Q., Nan, L., **Li, X.,** Tsamis, E., Rajshekhar, R., Dwivedi, I., Drori, I., Sajda, P., & Hood, D. C. (2019). **Assessing the Ability of Convolutional Neural Networks to Detect Glaucoma from OCT Probability Maps**. Investigative Ophthalmology & Visual Science, 60(9), 1464–1464. [abstract] [poster]

Joiner, D., **Li, X.,** Eguia, M., Tsamis, E., Sun, A., Moraes, C. G. D., Ritch, R., & Hood, D. C. (2019). **Detecting progression of preserved areas of retinal nerve fiber layer in advanced glaucoma using optical coherence tomography**. Investigative Ophthalmology & Visual Science, 60(9), 5547–5547. [abstract] [poster]

Eguia, M., **Li, X.,** Joiner, D., Tsamis, E., Moraes, C. G. D., Ritch, R., & Hood, D. C. (2019). **Detecting progression on local areas of retinal nerve fiber layer in glaucoma suspects and early glaucoma using optical coherence tomography**. Investigative Ophthalmology & Visual Science, 60(9), 5594–5594. [abstract] [poster]

Sun, A., Tsamis, E., **Li, X.,** Tsang, K., Al-Aswad, L., Blumberg, D., Cioffi, G., Liebmann, J. M., Moraes, C. G. de, & Hood, D. C. (2019). **Detecting progression of early glaucoma using alternative methods with optical coherence tomography**. Investigative Ophthalmology & Visual Science, 60(9), 5545–5545. [abstract] [poster]