

# XINHUI LI

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## EDUCATION

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

**Columbia University**, New York, NY, US (GPA: 4.0/4.3) M.S., Biomedical Engineering, 2019

**Xiamen University**, Xiamen, FJ, CN (GPA: 3.6/4.0) B.S., Pharmaceutical Science, 2017

**Utrecht University**, Utrecht, UT, NL Exchange Student, Economics and Humanities, 2016

## RESEARCH INTERESTS

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Brain Machine Interaction, Machine Learning, Image Analysis, Neuroimaging Software Development

## PROFESSIONAL EXPERIENCE

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### Assistant Research Engineer

Jun 2019 - Present

*Computational Neuroimaging Lab, Child Mind Institute, New York, NY, US*

Advisors: Michael P. Milham, Steven Giavasis, Ting Xu

- Developing the software Configurable Pipeline for the Analysis of Connectomes (C-PAC) for MRI processing and analysis; maintaining C-PAC pipeline configuration GUI and user documentation; implemented fMRIPrep-options, longitudinal, surface and non-human primate pipelines in C-PAC.
- Developed 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.

### 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 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

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**Teaching Assistant**, *Computer Systems Programming*, University of Pennsylvania, Coursera Fall 2020  
**Mentor**, *Mandarin*, New York State Psychiatric Institute, New York, NY, US Spring 2019  
**Volunteer Teacher**, *Natural Science*, Bayannur Primary School, Bayannur, NM, CN Summer 2014

## TECHNICAL SKILLS

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

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

**Deep Learning Libraries:** TensorFlow, Keras, PyTorch, Weka

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

## PUBLICATIONS

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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. (2020). **U-Net Model for Brain Extraction on Non-human Primates**. *NeuroImage*. (under review) [[preprint](#)]

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*. (under review)

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](#)]

Milham, M. P., **Li, X.**, Jin, H., Giavasis, S., Ai, L., et al. **Moving Functional MRI Beyond Pipeline-Related Variation in Preprocessing**. (in prep)

**Li, X.**, Feng, Y., & He, X. **Deep Learning for Motor Imagery Classification with EEG Data**. (in prep)

## POSTERS AND PRESENTATIONS

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

**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 2021*. [abstract]

**Li, X.**, Giavasis, S., Jin, H., Ai, L., Sólón, 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](#)]

Jin, H., Giavasis, S., **Li, X.**, Sólón, 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](#)]

**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](#)]

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.

[\[abstract\]](#) [\[poster\]](#)

## SCHOLARSHIPS AND MEMBERSHIPS

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*Columbia University, New York, NY, US*

First Prize, Columbia Business School & Engineering Graduate Student Council Hackathon	2019
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*Xiamen University, Xiamen, FJ, CN*

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