Xi He Xie

CONTACT INFORMATION

Brain Networks Lab (Raj Lab)
Department of Neuroscience
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GITHUB PROFILE

https://github.com/axiezai/

RESEARCH INTERESTS

Data-Driven Methods, Bayesian Inference, Deep Learning, Network Theoretics, Open Science, Computational Neuroscience

EDUCATION

Dept. of Neuroscience, Weill Cornell Graduate School of Medical Sciences, New York, NY.

Ph.D Candidate, Computational Neuroscience, June 2015 - Present.

- Dissertation: *Emergence of neuronal dynamics from brain structure in multi-modal resting-state brain imaging*
- Advisor: Dr. Ashish Raj & Dr. Amy Kuceyeski
- Expected Thesis Defense Date: October 2021.

Dept. of Biomedical Engineering, The City College of New York (CUNY), New York, NY.

B.S. in Biomedical Engineering, May 2013.

- Final Project: *Pressure-regulated tourniquet for clinical intravenous interventions*
- Research Project: *Clinician accessible tools for GUI computational models of trans-scranial electrical stimulation: BONSAI and SPHERES*
- Advisor: Dr. Jacek Dmochowski, Dr. Marom Bikson, Dr. Lucas Parra

RESEARCH

Dept. of Radiology & Biomedical Imaging, University of California San Francisco, San Francisco, CA.

Visiting Graduate, May 2018 – Present.

- Ph.D. Mentor: Dr. Ashish Raj and Dr. Srikantan Nagarajan
- Research Focus: Linear macroscopic brain models and multimodal fusion of Magnetoencephalography (MEG) and diffusion magnetic resonance imaging (dMRI).

Dept. of Neuroscience & Brain and Mind Research Institute, Weill Cornell Medicine, Cornell University, New York, NY.

Ph.D. Candidate, June 2015 – Present

- Ph.D Mentor: Dr. Ashish Raj
- Research Focus: Multi-modal brain imaging fusion with generative models.

Dept. of Biomedical Engineering, Grove School of Engineering at CCNY (CUNY), New York, NY.

Undergraduate Research Assistant, June 2011 – June 2013

- Undergraduate Mentors: Dr. Jacek Dmochowski, Dr. Marom Bikson, Dr. Lucas Parra
- Research Focus: Inverse model of brain activity and clinician tools for trans-cranial direct current stimulation (tDCS).

Industry Experience

GE Healthcare, NJ, Junior Engineer, September 2014 - May 2015

- Assisted senior engineers to create and review surgical tool blueprints in accordance to both U.S. FDA and European EMA standards.

Fuji Medical Systems, CT, Quality Assurance Engineer, July 2013 - June 2014

- Coordinated with teams of software engineers to develop and execute testing protocols of radiology image communications system.

Keen Home, NY, Intern, March 2013 - July 2013

- Worked within a team of recent graduates to deliver and present prototype ventilation units to product manager.

Student Mentoring

(joint mentoring with A. Raj)

1. Akanksha (2019-2020, USF Master's Student in Data Science)
2. QingYi Sun (2019-2020, USF Master's Student in Data Science)
3. Areez Malik (2019-2020, Summer Intern)
4. Xiao Gao (2018, UCSF Master's student in Biomedical Imaging)

Teaching

Course instructor: *Data Science Basics in Neuroscience* - Weill Cornell Medicine

Publications

In preparation

- D. Bernardo et al., *Modeling Developmental Maturation in Macroscopic Brain Activity with Spectral Graph Theory*
- K. Ranasinghe, P. Verma, C. Cai, X. Xie, et al., *Abnormal neural oscillations reveal excitatory-inhibitory imbalance distinctly associated with amyloid and tau depositions in Alzheimer's disease*, submitted to Neuron.
- H. Jin, Y. Gao, X. Xie, J. Cummings, A. Raj, S. Nagarajan, *Time-varying Dynamic Network Model For Dynamic Resting State Functional Connectivity in fMRI and MEG imaging*, submitted to Neuroimage.
- X. Xie, A. Kuceyeski, S.A. Shah, N.D. Schiff, S. Nagarajan, and A. Raj, *Parameter Identifiability and Non-Uniqueness in connectome based neural mass models*,

Peer-Reviewed Journals

1. X. Xie, C. Cai, P.F. Damasceno, S. Nagarajan, and A. Raj, *Emergence of canonical functional networks from complex Laplacian of structural connectome*, Neuroimage (2021), Volume 237. https://doi.org/10.1016/j.neuroimage.2021.118190
2. M. Bisson, J. Romero, T. Kurth, M. et al., *GPU-accelerated diffusion MRI tractography in DIPY*, ISMRM Annual Meeting Proceedings (2021). https://www.ismrm.org/21/program-files/D-145.htm
3. Gould van Praag, C., Levitis, E., Gau, R., et al., *Centering inclusivity in the design of online conferences*, GigaScience (2021), Volume 10, Issue 8. https://doi.org/10.1093/gigascience/giab051.
4. Gau, R., Noble, S., Heuer, K., Bottenhorn, K. L., Bilgin, I. P., Yany, Y, ..., and The Brainhack Community *Brainhack: developing a culture of open, inclusive,*

community-driven neuroscience, Neuron (2021).
PsyArXiv PrePrint

5. A. Raj, C. Cai, X. Xie, E. Palacios, J. Owen, P. Mukherjee, and S. Nagarajan, *Spectral graph theory of brain oscillations*, Human Brain Mapping (2020), pp. 1-16. https://doi.org/10.1002/hbm.24991
6. D. Q. Truong, M. Huber, X. Xie, A. Datta, A. Rahman, L. C. Parra, J. Dmochowski, M. Bikson, *Clinician accessible tools for GUI computational models of transcranial electrical stimulation: BONSAI and SPHERES*, Brain Stimulation 7, no. 4 (2014): 521-24. https://doi.org/10.1016/j.brs.2014.03.009

Open Source Efforts

***Staff Officer at UCSF Open Science Group*, Campus group for open science outreach, education, events, and other initiatives**.
https://openscience.ucsf.edu/

***Pipetography*, Nipype based diffusion MRI pre-/post-processing pipeline**.
https://axiezai.github.io/pipetography/

***Spectrome*, Spectra and connectome based brain model simulation**.
https://github.com/Raj-Lab-UCSF/spectrome

***Pydra*, Dataflow Engine**.
https://github.com/nipype/pydra

***Nipype*, Python Pipelines and Interfaces**.
https://github.com/nipy/nipype

***Cortography*, Utilities for manipulating cortical atlases of the human brain**.
https://github.com/Raj-Lab-UCSF/cortography

Selected Conferences & Hackathons

- *Neuromatch Deep Learning 2021 - Interactive Student*, Online Meeting (August 2021).
- *Neuromatch Computation Neuroscience 2021 - Professional Development Workshop Speaker*, Online Meeting (July 2021).
- *Brainhack Global 2020 - New York Satellite Event Organizer and instructor*, Online Meeting (June, 2020).
- *Frontiers in Neuropsychiatry Seminar (FINS) - Speaker*, Online Seminar (October, 2020).
- *Organization for Human Brain Mapping (OHBM) Hackathon Teaching Assistant*, Online Meeting (June, 2020).
- *Organization for Human Brain Mapping (OHBM)*, Online Meeting (June, 2020).
- *Teaching assistant at Organization for Human Brain Mapping (OHBM) Brainhack*, Online Event (June 2020).
- *Teaching Assistant at Bay Area Brainhack*, San Francisco, CA (2020).
- *Progress in Neuroscience Seminar*, Weill Cornell Medicine, New York, NY (2020).
- *UCSF Radiology China Basin Colloqium*, UCSF, San Francisco, CA (2019).
- *UCSF Bakar Institute Meeting*, UCSF, San Francisco, CA (2019).
- *Teaching Assistant at Bay Area WiMLDS Scikit-Learn Sprint*, San Francisco, CA (2019).

- *Society for Neuroscience*, Annual Meeting, San Diego, CA (2018).
- *Neurohackademy*, University of Washington, Seattle, WA (2018).
- *Mathematical Physics and Harmonic Analysis Seminar*, CUNY Graduate Center,New York, NY (2016).
- *Brainhack Los Angeles*, Los Angeles, CA (2016).

Awards

2020	ReproNim/INCF Fellow: https://www.repronim.org/fellowship.
2018	NeuroHackademy Travel Grant, a 2-week conference focusing on reproducibility, open source sharing, and software practices in neuroimaging, including a poster presentation and a final presentation of hackathon project.
2016	Brainhack Travel Grant, a 1-week hackathon as junior investigator and presented on neural mass modeling of human electroencephalography data.
2013	Lionel Malamed Award for student athlete academic achievements, from The City College of New York.
2013	Tau Beta Pi, Engineering Honor Society inductee.
2009	New Era Scholarship, from The City University of New York to pursue a degree in biomedical engineering.

Relevant Skills

Languages:	Mandarin Chinese (expert)
Technical:	Python, Shell, MatLab, Version Control, High performance computing, Amazon Web Services, Continuous Integration, Docker and Singularity.

References

⋆ **Amy Kuceyeski**, Professor of Statistics and Data Science, Cornell University, NY, USA, +1(330) 340-5847, amk2012@med.cornell.edu,
https://stat.cornell.edu/people/field-faculty/amy-kuceyeski

⋆ **Srikantan Nagarajan**, Professor of Radiology and Bio-Engineering, University of California San Francisco, CA, USA, +1(415) 476-4982, srikantan.nagarajan@ucsf.edu,
https://profiles.ucsf.edu/srikantan.nagarajan

⋆ **Pablo F. Damasceno**, Postdoctoral Fellow & Applied Data Scientist, Center for Intelligence Imaging, University of California San Francisco, CA, USA, +1(734) 926-8070, pablo.damasceno@ucsf.edu,
https://pfdamasceno.github.io/

⋆ **Pedro D. Maia**, Professor of Applied Mathematics, University of Texas Arlington, TX, USA, +1(206) 661-4372, pedro.doria.maia@gmail.com,
https://sites.google.com/site/pedrodoriamaia/