

Huili Sun

POSTDOCTORAL RESEARCHER · BIOENGINEERING

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Education

Yale University

PHD BIOMEDICAL ENGINEERING

- Dissertation: Development of the human brain networks during infancy
- Advisor: Dr. Dustin Scheinost

New Haven, CT
Jan 2021 - Sep 2025

University of Electronic Science and Technology of China

BS ELECTRONIC INFORMATION ENGINEERING

- Thesis: Fundamental community structure detection in resting-state brain network
- Advisor: Dr. Shi Gu

Chengdu, China
Sep 2016 - June 2020

Work Experience

RESEARCH

University of Pennsylvania

POSTDOCTORAL RESEARCHER

- Advisor: Dr. Dani Bassett

Philadelphia, PA
Oct 2025 - present

TEACHING

GUEST LECTURER *Network Neuroscience* University of Pennsylvania

Fall 2025

TEACHING FELLOW, *Introduction to Biomedical Computation*, Yale University

Spring 2022/ 2024

Publications

PUBLISHED

Saloni Mehta*, **Huili Sun***, Nicola Micali, Daniel Holden, Krista Fowles, Samantha Rossano, Jiazhen Zhang, Chao Ma, Paul Han, Wonil Lee, Alvaro Duque, Pasko Rakic, Stephanie M Groman, Richard E Carson, Dustin Scheinost, Takuya Toyonaga. High-resolution in utero SV2A PET imaging of the nonhuman primate brain using the NeuroEXPLORER. *Journal of Cerebral Blood Flow and Metabolism*. 2026

Huili Sun, Saloni Mehta, Milana Khaitova, Bin Cheng, Xuejun Hao, Marisa Spann, Dustin Scheinost. Brain age prediction and deviations from normative trajectories in the neonatal connectome. *Nature Communications*. 2024

Matthew Rosenblatt, Link Tejavibulya, **Huili Sun**, Chris C. Camp, Milana Khaitova, Brendan D. Adkinson, Rongtao Jiang, Margaret L. Westwater, Stephanie Noble, Dustin Scheinost. Power and reproducibility in the external validation of brain-phenotype predictions. *Nature Human Behavior*. 2024

Huili Sun, Javid Dadashkarimi, Matthew Rosenblatt, Raimundo X. Rodriguez, Dustin Scheinost. Edge-centric controllability of the human brain structural network. *Imaging Neuroscience*. 2024

Huili Sun, Rongtao Jiang, Wei Dai, Alexander J. Dufford, Stephanie Noble, Shi Gu, Marisa Spann, Dustin Scheinost. Network controllability of structural connectomes in the neonatal brain. *Nature Communications*. 2023

Jean Ye, **Huili Sun**, Siyuan Gao, Javid Dadashkarimi, Matthew Rosenblatt, Raimundo X. Rodriguez, Saloni Mehta, Rongtao Jiang, Stephanie Noble, Margaret L. Westwater, Dustin Scheinost. Altered Brain Dynamics Across Bipolar Disorder and Schizophrenia During Rest and Task-switching Revealed by Overlapping Brain States. *Biological Psychiatry*. 2023

Javid Dadashkarimi, Amin Karbasi, Qinghao Liang, Matthew Rosenblatt, Stephanie Noble, Maya Foster, Raimundo Rodriguez, Brendan Adkinson, Jean Ye, **Huili Sun**, Chris Camp, Michael Farruggia, Link Tejavibulya, Wei Dai, Rongtao Jiang, Angeliki Pollatou, Dustin Scheinost. Cross Atlas Remapping via Optimal Transport(CAROT): Creating connectomes for different atlases when raw data is not available. *Medical Image Analysis*. 2023

Rongtao Jiang, Stephanie Noble, Jing Sui, Kwangsun Yoo, Matthew Rosenblatt, Corey Horien, Shile Qi, Qinghao Liang, **Huili Sun**, Vince D Calhoun, Dustin Scheinost. Associations of physical frailty with health outcomes and brain structure in 483 033 middle-aged and older adults: a population-based study from the UK Biobank. *The Lancet Digital Health*. 2023

Dustin Scheinost, Angeliki Pollatou, Alexander J. Dufford, Rongtao Jiang, Michael C. Farruggia, Matthew Rosenblatt, Hannah Peterson, Raimundo X. Rodriguez, Javid Dadashkarimi, Qinghao Liang, Wei Dai, Maya L. Foster, Chris C. Camp, Link Tejavibulya, Brendan D. Adkinson, **Huili Sun**, Jean Ye, Qi Cheng, Marisa N. Spann, Max Rolison, Stephanie Noble, Margaret L. Westwater. Machine Learning and Prediction in Fetal, Infant, and Toddler Neuroimaging: A Review and Primer. *Biological Psychiatry*. 2022

ACCEPTED

Brendan D. Adkinson, Matthew Rosenblatt, **Huili Sun**, Javid Dadashkarimi, Link Tejavibulya, Corey Horien, Margaret L. Westwater, Raimundo X. Rodriguez, Stephanie Noble, Dustin Scheinost Feature selection leads to divergent neurobiological interpretations of brain-based machine learning biomarkers. *Accepted in Nature Human Behaviour*, 2025

IN PREPRINT

Huili Sun, Angelina Vernetti, Marisa Spann, Katarzyna Chawarska, Laura Ment, Dustin Scheinost. White-matter controllability at birth predicts social engagement and language outcomes in toddlerhood. *Under Revision in Translational Psychiatry*. <https://doi.org/10.1101/2025.02.19.638284>, 2025

Huili Sun, Takuya Toyonaga, Saloni Mehta, Chris Camp, Samantha Rossano, Marisa Spann, Richard Carson, Dustin Scheinost. Fetal network controllability co-develops with synaptic density and synchronizes with maternal network controllability during pregnancy. *Under Review in PNAS* <https://doi.org/10.1101/2025.09.03.674103>, 2025

Awards, Fellowships, & Grants

2026	Rising Stars in in Computational and Data Sciences , Santa Fe Institute	
2025	Wharton Summer Fellowship , Nathaniel Wharton Fund	\$6,000
2024	Google PhD Fellowship (Finalist) , Google Research	
2024	ISDP Travel Award , International Society for Developmental Psychobiology	\$325
2023	FIT'NG Young Investigator Award , Fetal, Infant, and Toddler Neuroimaging Group	\$175
2023	Flux Student Travel Award , Flux Program	\$500
2023	Yale WFF Seed Grant , Yale Women Faculty Forum	\$800
2022	ISDP Travel Award , International Society for Developmental Psychobiology	\$325
2020	Outstanding Graduates , Department of Education, Sichuan, China	
2018	National Scholarship , Ministry of Education, China	CN¥10,000
2017,2018	Excellent Student Scholarship , UESTC	CN¥2,000
2017,2018	First-Class Student Scholarship , Glasgow College, UESTC	CN¥30,000

Presentations

INVITED TALKS

Dec 2025. *Brain age prediction and deviations from normative trajectories in the neonatal connectome*. FIT'NG Together Events, Vitual.

Dec 2025. *Development of controllability in fetuses and infants is supported by synaptic density*. HBCD Monthly site meeting, Vitual.

Oct 2025. *Development of the human brain networks in infancy*. UPenn BE 5660 Guest Lecture, Philadelphia, PA, USA.

Sep 2025. *Development of controllability in fetuses and infants is supported by synaptic density*. FIT'NG 2025, Dublin, Ireland.

Oct 2024. *Infant brain controllability development*. Complex Systems Lab, Philadelphia, PA, USA.

Oct 2024. *Development of human brain network during infancy*. Haskins Laboratories, New Haven, CT, USA.

Sep 2024. *Network controllability of fetal brain connectome*. ISDP 2024, Chicago, IL, USA.

Feb 2024. *Altered infant brain ages by maternal effects and prediction of later cognition*. Yale Child Study Center Seminar, New Haven, CT, USA.

Nov 2023. *Developmental of Network Controllability in the Neonatal Brain*. Yale BME Seminar 2023, New Haven, CT, USA.

Oct 2023. *Network controllability of structural connectomes in the neonatal brain*. Glasgow College Alumni Talks 2023, UESTC, Chengdu, China.

Sep 2023. *Maternal postnatal depression is associated with older brain age in infants and worse toddler cognitive performance*. FIT'NG Conference 2023, Santa Rosa, CA, USA.

SELECTED POSTERS

Sep 2024. *Network controllability of the fetal structural connectome*. ISDP 2024, Chicago, IL, USA.

Sep 2023. *Edge-centric control theory applied to neonatal structural connectivity in term and preterm neonates predicts cognitive and social outcomes at 18-months*. Flux Conference 2023, Santa Rosa, CA, USA.

Nov 2022. *Controllability of the infant structural brain network*. ISDP 2022, San Diego, CA, USA.

Jun 2020. *Fundamental Multilayer Community Structure Detection in Resting-state Brain*. OHBM 2020, Virtual.

Skills

Coding **Python, MATLAB, R, bash,**
Packages **PyTorch, Numpy, Pandas; EEGLAB; DSI-Studio, Freesurfer,**
Keywords **Neurodevelopment, Computational neuroscience, Network Control,**

Outreach & Professional Development

SERVICE AND OUTREACH

2024-Now **Trainee Committee Member**, FIT'NG
2018 **Licensee**, TEDxUESTC

AD HOC REVIEW

Nature Communications
Proceedings of the National Academy of Sciences
Nature Communications Biology
Developmental Cognitive Science
Scientific reports
Network Neuroscience
BMC Psychology

PROFESSIONAL MENTORSHIPS

Hongjuan Hu, (Master Student in Yale BME, 2025): advised on research projects and grad school application
Lucy Yang, (Summer Intern in Yale, 2025): advised on research projects
Rachel A. Ababio, (Post-bac RA in Columbia, 2024): advised on research projects
Kayla M. Delapenha, (Post-bac RA in Columbia, 2024): advised on research projects
Danielle Gruber, (Undergrad in Yale, 2023-2024): advised on graduate school application
Joshua Ceballos, (Undergrad in UCLA, 2023): advised on graduate school application